DOCTORAL THESIS

Organisational learning, innovation and performance in family-controlled manufacturing small and medium-sized enterprises (SMEs) in Australia

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Organisational Learning, Innovation and Performance in Family-Controlled Manufacturing Small and Medium-Sized Enterprises (SMEs) in Australia

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By

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STATEMENT OF ORIGINALITY

To the best of my knowledge and belief, the work presented in this dissertation is original, except as acknowledged in the text. All sources used in the study have been cited and no attempt has been made to project the contributions of other researchers as my own. Further, the material has not been submitted, either in whole or in part for a degree at this or any other university.

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ABSTRACT

Organisational learning has been identified as a lasting source of competitive advantage in uncertain environments. Plentiful research has highlighted that knowledge and skills and the capabilities they develop are strategic resources and that effective utilisation of these resources enhances firm innovation and performance. However, in spite of this widespread recognition, family businesses, specifically family SMEs, have not been the subject of previous research exploring the strategic impact of organisational learning on innovation and firm performance. This research, therefore, sets out a theoretical framework drawing upon organisational learning theory and innovation, and explores the strategic links between organisational learning, innovation and firm performance "within" family SMEs and "between" family and non-family SMEs.

The study was undertaken in an Australian context using a sample of 222 manufacturing SMEs comprised of 104 family and 118 non-family SMEs. The data were obtained from the Business Longitudinal Survey conducted by the Australian Bureau of Statistics over the financial years 1995/96 - 1997/98, which provides the most recent available comprehensive longitudinal dataset of SMEs in Australia.

The study involved three constructs: organisational learning, innovation and firm performance. Organisational learning was operationalised using *commitment to learning, shared vision, and networking*. To measure *commitment to learning*, three variables, employee training, management development, and comparison of performance were used. *Shared vision* was measured using the presence of formal planning in the firms. *Networking* was measured using the existence of external networks. The *innovation* construct was measured using product and process innovation

intensity, and *firm performance* was measured by growth of sales and rate of return on total assets.

Data were analysed using two tests: regression analysis and the Chow test. Whereas the former test was conducted to explore the direct and indirect effects of organisational learning on innovation and firm performance "within" family SMEs, the latter was conducted to compare those effects "between" family and non-family SMEs.

Our "within" results, concerning the direct effects of organisational learning on innovation found that network relationships positively influenced innovation in family SMEs. With regard to the direct effects of organisational learning on performance, we found that management development and formal planning were positively linked with family SMEs' performance. Moreover, relating to innovation and firm performance, our research concludes that innovation in family SMEs is positively linked with their performance. In the case of the indirect effect, we found that networks affect firm performance via innovation. With respect to the "between" results, we found that whereas the effects of formal planning and innovation on firm performance of family SMEs were stronger than for non-family SMEs, the effects of employee training and management development on firm performance were stronger in non-family SMEs. Concerning networks, we found a stronger effect of family SMEs' networks on their innovation than non-family SMEs.

Finally, we re-emphasised the necessity of more scholarly studies linking organisational learning with family business characteristics such as familiness, leadership, ownership, social interactions and organisational process.

Keywords: organisational learning; innovation; firm performance; SMEs, family firms and family SMEs.

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACFB	Australian Centre for Family Business
ANZSIC	Australian and New Zealand Standard Industry Classification
ASX	Australian Securities Exchange
BCA	Business Council of Australia
BLS	Business Longitudinal Survey
CEO	Chief Executive Officer
CURF	Confidential Unit Record File
DIST	Department of Industry Science and Tourism
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
FBA	Family Business Australia
GDP	Gross Domestic Product
GNP	Gross National Product
KBV	Knowledge-based View
KIUS	Knowledge Integration and Utilisation Systems
OECD	Organisation for Economic Co-operation and Development
SMEs	Small and Medium-Sized Enterprises
RBV	Resource-based View
ROTA	Return on Total Assets
VIFs	Variation Inflation Factors

CHAPTER ONE

1. INTRODUCTION AND OVERVIEW

1.1 BACKGROUND

Organisations continuously search for effective strategies to improve their competitiveness. In stable environments, competitiveness has been achieved through effective operational practices such as specialisation of labour and cost control, as proposed in the early management and economics literature (Mourdoukoutas & Papadimitriou, 1998). Recent changes in the competitive environment, particularly the emergence of globalisation (Birdthistle & Fleming, 2005; Bumes, Cooper, & West, 2003; Kalburgi, 1995; Knight, 2000; Salavou, Baltas, & Lioukas, 2004), knowledge-based economies (Birdthistle & Fleming, 2005; Salavou et al., 2004), and advances in information and communication technology (Bumes et al., 2003; Knight, 2000; Salavou et al., 2004), have compelled organisations to continue to seek new strategies because conventional strategies are no longer sufficient to provide a competitive edge (Chirico & Salvato, 2008; Dixon, 1992).

Researchers have proposed the notion of organisational learning (De Geus, 1988; Levitt & March, 1988; Senge, 1990; Sinkula, Baker, & Noordewier, 1997; Watkins & Marsick, 1993) as an effective strategy for sustaining and improving firms' competitiveness and performance, particularly in dynamic business environments (Birdthistle, 2006; Birdthistle & Fleming, 2005; Mavondo, Chimhanzi, & Stewart, 2005; Sadler-Smith, Spicer, & Chaston, 2001). For example, Birdthistle (2006) asserts

> *Increasing global competition is changing the nature of knowledge necessary for survival in the world of business. Managing change has become a crucial element*

> *of competitive advantage for it is only by guiding people through change as fast and as painlessly as possible that the business can hope to respond to market pressures before the world moves on. So the ability to learn is a priority for businesses that wish to compete effectively* (Birdthistle 2006, p. 6).

Scholars posit that learning is a unique form of an intangible resource (Foss, 1996a; Nonaka, 1994) whereby individuals in an organisation are stimulated to continually accumulate, utilise and share knowledge for individual as well as firm performance (Inkpen, 1996; Nonaka, 1991; Prahalad & Hamel, 1990; Senge, 1990; Watkins & Marsick, 1993). Moreover, many studies (Edmondson & Moingeon, 1998; Nonaka, 1994; Senge, 1990) attest that the new knowledge and skills created through learning improves firms' competitiveness and performance by enhancing their capabilities including innovativeness (Baker & Sinkula, 1999; Chirico, 2008; Huber, 1998; Kieser & Koch, 2008; Stata, 1989).

Hult, Hurley and Knight (2004) and Woodside (2005) highlight that innovativeness is openness to newness and relates to the firm's capacity to engage in innovation. From this perspective, research indicates that innovation is associated with the notions of generation, acceptance, and implementation of new ideas, processes, products and services (Damanpour, 1991; Drucker, 2002; Tidd, Bessant, & Pavitt, 2001), and is largely shaped by the firm's learning orientation (Baker & Sinkula, 1999; Calantone, Cavusgil, & Zhao, 2002; Chirico, 2008; Garcia-Morales, Ruiz Moreno, & Liorens-Montes, 2006). Academics and practitioners underscore that firms promoting learning have the ability to create an innovative culture that allows them to maintain a competitive position and perform better. In this sense, researchers recognise that the effect of organisational learning on firm performance is likely to be both direct and indirect.

Support for direct and indirect effects of organisational learning on firm performance has been found in large, widely-held firms by a number of researchers (Baker & Sinkula, 1999; Calantone et al., 2002). Nooteboom (2006), Bates and Khasawneh (2005), Therin (2002), Baker and Sinkula (1999) and Huber (1998) found support for the linkage between organisational learning and innovation while Calantone et al. (2002) found positive relationships among organisational learning, innovation and firm performance in US manufacturing and service industries. In the context of family businesses, Craig and Moores (2006) found that established family firms in Australia placed substantial importance on innovation practices and strategy.

Despite the growing interest in organisational learning as an effective strategy for firm performance, no empirical research has explored the links between organisational learning, innovation and performance in family firms[1] - the firms which are most prevalent in the business domain in most economies. Family businesses are reckoned as major contributors to the well-being of the economy in terms of employment generation, wealth creation, and industrialisation (Neubauer & Lank, 1998) and are considered the backbone of economies (Bird, Welsch, Astrachan, & Pistrui, 2002). Arguably family firms have a priori features e.g. long tenure CEOs (Le Breton-Miller & Miller, 2006; Moores, 2009; Tsai et al, 2006), higher of levels of trust and interaction (Jones, 1983; Miller, Breton-Miller, & Scholnick, 2008) between management and employees, flexible structures (Birdthistle, 2005) and unique social systems (Zahra, Hayton, Neubaum, Dibrell, & Craig, 2008; Zahra, Neubaum, & Larraneta, 2007)) which suggest

[1] The terms “family firm”, “family business” and “family-controlled firm” are used interchangeably in this study.

they might encourage greater learning than non-family firms. Moreover, taking changes in the competitive, technological, and global environments into account, recent research (Zahra et al., 2008) highlights the importance of studying strategies of family firms associated with innovation and retention of market position.

With this background, given a combined interest in organisational learning, innovation, and firm performance, this study examines the direct effects of (a) organisational learning on innovation and firm performance (b) innovation on performance and, (c) the indirect effect of organisational learning on firm performance via innovation in family firms, in particular family small and medium-sized enterprises (SMEs)[2]. In addition, the effects of organisational learning on innovation and firm performance between family and non-family firms are compared.

1.2 RESEARCH QUESTIONS

As mentioned previously, researchers acknowledge that organisational learning is a strategy that has the capacity to generate and advance a firm's resources for organisational development and adaptation. It has been proposed that organisational learning provides a platform for firms to accumulate, utilise and share knowledge, and that it facilitates innovation, thereby stimulating performance and growth of the firm (Garvin, 1993; Inkpen, 1996; Nonaka, 1991; Senge, 1990; Watkins & Marsick, 1993) in a changing environment.

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[2] The European Commission (2005) defined the SME as an enterprise which employs fewer than 250 persons and which has an annual turnover not exceeding EUR 50 Mn, and/or an annual balance sheet not exceeding EUR 45 Mn.

In Australia, firms employing more than 4 and fewer than 200 people are often defined as SMEs (*Ministry of Economic Development (MOED) New Zealand, 2006, p. 35).*

Although few researchers have examined the relationships between organisational learning and the performance of SMEs (Chaston, Badger, & Sadler-Smith, 2001; Sadler-Smith et al., 2001), none have examined the relationships between organisational learning, innovation and performance in family SMEs, in either the organisational learning or family business research domains. Only one study (Birdthistle, 2006) has investigated the learning organisation characteristics in Irish family SMEs. While the majority of the research undertaken in family businesses has dealt with management succession, governance (Denison, Lief, & Ward, 2004; Wortman, 1994) and sibling rivalry (Birdthistle & Fleming, 2005), organisational learning research (Birdthistle & Fleming, 2005; Gibb, 1997) has extensively focused on large widely-held firms. Hence there is a need for exploring the organisational learning – innovation – firm performance linkages in family SMEs. With this background, this study addresses the following research questions;

(1) Does organisational learning in family SMEs affect firm innovation?

(2) Does organisational learning in family SMEs affect firm performance?

(3) (a) Does innovation in family SMEs affect firm performance? and, (b) Is the relationship between organisational learning and firm performance intervened by innovation?

(4) Do these relationships and patterns in family SMEs differ from those of non-family SMEs?

1.3 OBJECTIVES OF THE RESEARCH

As mentioned, the overarching objective of this dissertation is to examine the relationships between organisational learning, innovation and firm performance in family SMEs. The lack of research in this area highlights a knowledge gap. This study aims to address this gap and in doing so provide directions for family firm owners and management to sustain and improve their businesses' performance.

With this in mind, the research addresses the following topics in particular: organisational learning, innovation, family businesses and the nexus between organisational learning, innovation and firm performance in family SMEs. The detailed objectives that guide the research are:

- To review and analyse relevant theoretical literature that focuses on organisational learning, innovation and family businesses.

- To generate a set of empirically testable hypotheses linking organisational learning, innovation and performance "within" family SMEs and "between" family and non-family SMEs.

- To empirically test the hypotheses. This includes operationalising the theoretical constructs and testing the hypotheses using appropriate quantitative techniques.

- To explore the relationships between organisational learning, innovation and firm performance "within" family SMEs and "between" family and non-family SMEs.

- To discuss the empirical and practical contributions of the research findings, to assess the limitations of the study and to present suggestions for future research.

1.4 SCOPE OF THE RESEARCH

This research is restricted to manufacturing SMEs in Australia and hence the findings and the conclusions drawn from the research are representative of Australian manufacturing SMEs only.

1.5 CONTRIBUTION OF THE RESEARCH

This research can be justified in theoretical and practical terms. The theoretical contribution includes a better understanding of the strategic importance of organisational learning and innovation for family SME performance, an area in which empirically tested studies are scarce. Moreover, the theoretical contribution helps researchers to advance knowledge in the areas of organisational learning and innovation in family businesses. The practical contributions are beneficial to practitioners and the policy-makers who wish to improve firms' competitiveness and performance.

1.5.1 FAMILY BUSINESS, ORGANISATIONAL LEARNING AND INNOVATION FIELDS

The findings of this research provide a valuable theoretical contribution to the fields of family businesses, organisational learning and innovation. First, this research includes a comprehensive examination of the combination of organisational learning, innovation and performance in family SMEs, which is an under-researched area, by integrating the literature on organisational learning, innovation and family businesses. This integrated

review of the relevant literature has the potential to be a significant contribution in itself. Second, the research contributes to filling the gap in strategy-focused research in the domain of family businesses. Third, prior studies admit the paucity of empirical research into the area of family businesses and emphasise the need for more research (Shanker & Astrachan, 1996; Sharma, Chrisman, & Chua, 1997), specially in the field of organisational adaptation and changes (Chirico & Salvato, 2008; Hatum & Pettigrew, 2004). In responding to that need this research is designed to empirically test organisational learning, innovation and performance in family firms in particular family SMEs. Furthermore, the research compares and contrasts the effects of organisational learning on innovation and firm performance, and the effects of innovation on performance of family SMEs with non-family SMEs, contributing to the resource-based view (RBV) inspired debate about the "familiness" basis for sustainable competitive advantages in family firms.

1.5.2 PRACTITIONERS AND POLICY-MAKERS

The findings of this research provide a practical contribution to practitioners and policy-makers. As discussed, a major issue of family firms, particularly family SMEs, is maintaining long-term survival and success in a competitive environment (Zahra et al., 2008). If the findings of this research support the proposition that organisational learning improves the innovation and the firm performance of family SMEs, then practitioners of family businesses can use those findings to strengthen the competitive position of their firms. Moreover, at state and national levels, policy-makers can make use of the findings when formulating policies and programs for supporting and developing SMEs.

1.5.3 RESEARCHERS

This research provides avenues for subsequent researchers to cross-check and validate the findings in countries outside Australia. Further, researchers can use this framework to examine the relationships between organisational learning, innovation and firm performance in industrial sectors other than manufacturing, and can also extend it to large companies, not-for-profit organisations and to government-controlled institutions.

1.6 RESEARCH METHOD

Research method occupies a central position in the research process. In this research a quantitative method is adopted. This method allows the researcher to use statistical models and hypothesis testing (Hughes, 1990). Drawing from the literature, a conceptual framework is developed and empirically tested with secondary data to address the research questions.

The data used for the analysis are obtained from the Business Longitudinal Survey (BLS) conducted by the Australian Bureau of Statistics (ABS) over the financial years 1994/95, 1995/96, 1996/97 and 1997/98, which is the most recently available comprehensive longitudinal database in Australia. In the BLS, data were collected using self-administered, structured questionnaires predominantly containing closed questions. The corpus contains data on 9,732 business units that employed fewer than 200 persons, and is a broad representation of Australian SMEs.

The hypotheses are empirically tested using multiple regression methods and Chow tests. The direct links between organisational learning, innovation and firm performance are tested using linear regression analysis. The indirect link that is the intervening effect of innovation between organisational learning and firm performance is tested using

linear regression analysis proposed by Baron and Kenny (1986) and Frazier, Tim and Barron (2004). The Chow test is used to compare the effects of organisational learning, innovation and performance between family and non-family SMEs. In addition, descriptive statistics are employed to analyse and interpret the statistical attributes of the sample and variables.

1.7 STRUCTURE OF THE RESEARCH

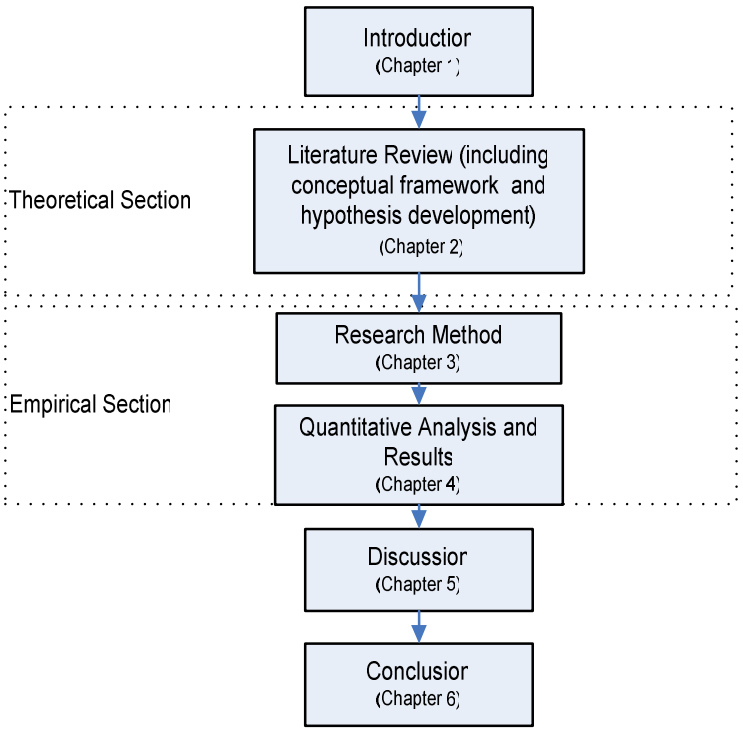
This research is developed through six chapters providing details of the background to the research, research questions, research objectives, scope of the research, research, research method, structure of the research, theoretical background of the research, conceptual framework, research variables and their measurement techniques, data source, analysis and interpretation of findings, discussion and conclusion including research contribution, limitations of the research and avenues for future research.

Following this introduction, Chapter Two reviews the literature related to the topic with a specific focus on the major concepts that impact on this research. The literature is drawn from three major streams – organisational learning, organisational innovation, and family businesses – which provide the theoretical framework within which this study fits and the platform upon which the research questions are developed. An overview of Australian family businesses and the hypotheses of the research are also presented. Chapter Three outlines the research method including data collection (the BLS), sample selection, operationalisation of conceptual framework, and statistical techniques used. The results of statistical analyses are reported and interpreted in Chapter Four. Chapter Five presents the research summary and the discussion of the results. Finally, Chapter Six provides the conclusion to the research, including

conclusive findings, contribution, limitations and avenues for future research. References and appendices follow.

A diagram illustrating the research structure is presented in Figure 1.1.

FIGURE 1-1 STRUCTURE OF THE RESEARCH



1.8 CHAPTER SUMMARY

This chapter provided an introduction and overview of the dissertation. The research questions, research objectives, scope of the research, contribution of the research, research method, and research structure were presented. The background to the dissertation showed the significance of organisational learning in the face of a competitive environment and its strategic importance for firm innovation and performance. Moreover, the chapter highlighted the lack of strategy focused-research in the domain of family businesses and placed emphasis on the need for more research in the area particularly, organisational adaptation and changes.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews relevant literature to develop a framework for research and hypotheses to address the research questions posed in Chapter One. The chapter consists of six sections including this introduction. Because the area of enquiry of this research is cross-disciplinary the literature from each area is initially considered independently, prior to developing a conceptual framework for the research. Accordingly, Section 2.2 discusses organisational learning and its importance for innovation and firm performance from a strategic perspective. In Section 2.3 organisational innovation is discussed. Section 2.4 discusses the context of this research: family business. Specifically, the significance of family businesses and family business research, the distinctive nature of family firms, and family business in Australia are discussed. The emergent conceptual framework and hypotheses are presented in Section 2.5, and Section 2.6 presents the chapter summary.

2.2 ORGANISATIONAL LEARNING

2.2.1 INTRODUCTION

In the global marketplace, maintaining a competitive position is vital for firm survival and success, but it is a challenging task largely due to increasing levels of competition resulting from globalisation (Birdthistle & Fleming, 2005; Bumes et al., 2003; Kalburgi, 1995; Salavou et al., 2004), knowledge-based economies (Birdthistle, 2006; Birdthistle & Fleming, 2005; Salavou et al., 2004), and information and communication technology diffusion (Bumes et al., 2003; Salavou et al., 2004). Strategic management researchers

(Barney, 2007; Porter, 1980; Teece, Pisano, & Shuen, 1997) emphasise the necessity of adopting an effective strategy in sustaining and safeguarding the firm's competitive position in such an environment as conventional strategies are no longer sufficient in improving a firm's competitiveness. In similar fashion, Nonaka (1991, p.96) stressed that *in an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge. Successful companies are those that consistently create new knowledge, disseminate it widely throughout the organisation, and quickly embody it in new technologies and products*. Taking changes in the environments into account, Chirico and Salvato (2008) highlighted that the speed of change in competitive environments has driven firms to develop processes directed toward changing and increasing their strategic capabilities and adaptiveness for yielding better performance. In this context, researchers suggest that a climate that stimulates learning in a firm has the capacity to create new knowledge and skills. Subsequently, such knowledge and skills enable the firm to be adaptive and innovative (Calantone et al., 2002; Huber, 1998; Hurley & Hult, 1998; Therin, 2002), thereby improving its competitiveness and performance (Craig & Moores, 2006; Nonaka, 1991). Thus, organisational learning has received considerable attention among academics and practitioners as an effective strategy for maintaining firm performance, particularly in the face of turbulent and highly competitive market conditions (Bumes et al., 2003; Sadler-Smith et al., 2001; Sinkula et al., 1997).

Further, in a nutshell, a number of reasons can be suggested as to why the study of organisational learning is currently so important. First, the notion of the importance of learning is gaining currency among organisations as they attempt to develop structures and systems that are more adaptable and responsive to change (Dodgson, 1993; Senge,

1990). Second, ongoing rapid technological change is having a profound influence on organisations (Dodgson, 1993; Therin, 2002). The turbulence engendered by technological changes in products, services, processes and organisation increases the uncertainties facing firms (Salavou et al., 2004). Third, it is argued that in a competitive environment learning is a crucial element of firm strategy in creating new knowledge and skills which are strategic resources that provides competitive advantage (Foss, 1996a,b; Garvin, 1993; Nonaka, 1991; Senge, 1990), and should be a focus of management concern. This view is closely related to the knowledge-based view (KBV) of the firm, in that the firm is seen as a bundle of competencies and capabilities that can be used to create competitive advantage (Grant & Spender 1996; Grant, 1996b). So, organisational learning is a topic that has taken on increased importance as scholars attempt to understand how organisations are able to continually adapt to their environments (Waldman, Keller, & Berson, 2006).

Given its importance, the notion of organisational learning has been extensively discussed in a broad range of literature, and it has been shown that if an organisation implements learning strategies effectively and regularly, it is certain to enhance firm performance (Bell, Whitwell, & Lukas, 2002; Chirico, 2008; Garcia-Morales et al., 2006; Garvin, 1993; Senge, 1990; Stata, 1989) in both a direct and an indirect manner.

2.2.2 CONCEPT OF ORGANISATIONAL LEARNING

Conceptions of organisational learning are ubiquitous. The topic has been studied for many years (Argyris & Schon, 1978; Fiol & Lyles, 1985; Garvin, 1993; Huber, 1991; Levitt & March, 1988; Senge, 1990;1996; Stata, 1989) in a range of academic disciplines including psychology, organisational development, management science, sociology and organisation theory, strategy, production management, leadership and

cultural anthropology (Easterby-Smith, 1997; Mavondo et al., 2005). Whereas psychologists examine organisational learning in terms of how individual learning occurs via human cognitive processes (Dodgson, 1993), theorists in organisational development view organisational learning from an organisational structural perspective, in which they explore how learning is developed within organisations (Kim, 1993; Levitt & March, 1988). The management science perspective is concerned with the gathering and processing of information in and about organisations (Easterby-Smith, 1997). The social and organisational theory perspective focuses on the broader social systems and organisational structures where learning may be embedded, and which may affect organisational learning, whereas the production management perspective focuses primarily on the relationship between learning and organisational productivity and efficiency. Leadership perspectives focus on identification, nurturing and utilisation of employees' knowledge and skills in the most effective way to meet the challenges of the organisational environment. Finally, cultural anthropologists see culture, both in its organisational and national manifestations, as a significant cause and effect of organisational learning.

The strategy perspective adopted in this study views organisational learning as a purposive quest to retain and to improve competitiveness, productivity and innovativeness in uncertain technological, market and environmental circumstances (Baker & Sinkula, 1999; Chirico, 2008; Garvin, 1993; Jones & Hendy, 1994; Senge, 1990; Therin, 2002). Strategy scholars (Garvin, 1993; Grant & Spender 1996; Nonaka, 1991; Senge, 1990) assert that learning is a strategic resource which provides a firm with a competitive advantage in the form of knowledge and skills. In similar vein, highlighting the significance of learning, studies (De Geus, 1988; Dixon, 1999) suggest that the ability and the rate at which organisations can learn to react more quickly than

their rivals create for them a source of competitive advantage and consequently, improve their capabilities and performance.

Although interest in organisational learning has grown increasingly during the last three decades (Bumes et al., 2003; Crossan & Guatto, 1996; Huber, 1991) (see Table 2.1), owing to emerging appreciation of its relevance to organisation competitiveness (Baker & Sinkula, 1999; Dodgson, 1993; Garvin, 1993; Huber, 1991; Senge, 1990), the notion of organisational learning has also been criticised on the grounds of the lack of definitional convergence across business disciplines and the insufficient conceptual rigour.

TABLE 2-1 INDICATORS OF GROWTH IN INTEREST IN ORGANISATIONAL LEARNING

	1960s	1970s	1980s	1990s	2000s*
Number of organisational learning articles written	3	19	50	184	317
Number of journals publishing organisational learning articles	3	18	35	80	153
Number of authors or groups of authors writing organisational learning articles	3	15	44	149	302

Extended from: Crossan & Guatto (1996), p. 108
** Data gathered by researcher through a comprehensive search of on-line databases*

The lack of definitional convergence is demonstrated by the numerous definitions shown in Table 2.2. However, Crossan, Lane and White (1999) and Huber (1991) have suggested that the definitional confusion is perhaps partly attributable to the diversity of research domains in which learning phenomena have been explored and to the different ontological stances of researchers.

TABLE 2-2 20 YEARS OF DEFINING ORGANISATIONAL LEARNING

Author (s)	Definitions
Argyris & Schon (1978, p. 2)	A process by which members of an organisation detect error or anomaly and correct it by restructuring organisational theory of action (the norms, assumptions, and strategies inherent in collective practices) and by encoding and embedding the results in their inquiry in organisational maps and images.
De Geus (1988, p. 71))	The process whereby management teams change their shared mental models of their company, markets and competitors.
Stata (1989, p. 64)	Organisational learning occurs through shared insights, knowledge and mental models … and builds on past knowledge and experience.
Garvin (1993, p. 80)	An organisation skilled at creating, acquiring, and transferring of knowledge and at modifying its behaviour to reflect new knowledge and insights.
Dodgson (1993, p. 337)	The way firms build, supplement and organise knowledge and routines around their activities and within their culture, and the way they adopt and develop organisational efficiency by improving the broad skills of their work force.
Loizo (1995, p. 25)	A process by which organisations change their cultures and systems in relation to market conditions; and they must do this in order to improve their competitiveness and achieve a sustainable competitive advantage.
Miller (1996, p. 486)	The acquisition of new knowledge by actors who are able and willing to apply that knowledge in making decisions or influencing others in the organisation.
Edmondson & Moingeon (1998, p. 12)	A process in which an organisation's members actively use data to guide behaviour in such a way as to promote ongoing adaptation of the organisation.

For this study, the definition put forward by Templeton, Lewis and Snyder (2002) is used, as it contains a synthesis of 78 explicit definitions of organisational learning. They defined organisational learning as a set of actions (knowledge acquisition, information distribution, information interpretation and organisational memory) in the organisation that intentionally and unintentionally influence positive organisational change.

Moreover, the phenomenon of organisational learning can be viewed from the viewpoint of different learning systems. By analysing organisational learning systems in a number of business organisations, Shrivastava (1983) identified six different types of learning system: (1) *One man* (sic) *institutions:* this is an organisational learning situation in which one person is the key to all learning processes, e.g. the entrepreneur and the chief executive officer. (2) *Mythological learning systems:* this system considers organisational myths, corporate stories and the corporate culture are as knowledge base. Myths lay the groundwork for development of organisational norms of knowledge sharing. (3) *Information seeking culture*: this term describes a system in which organisationally relevant information is shared among organisational members on a routine basis through networks and communication. Furthermore in this system, organisational members are encouraged to continuously seek and acquire information which may be directly or indirectly relevant to their individual tasks. (4) *Formal management systems*: these are the established systematic procedures developed to guide many of the standard and non-standard organisational activities in organisations, such as strategic planning, management information systems, environmental scanning, financial and budgetary control systems that facilitate learning. (5) *Participative learning systems:* this includes ad-hoc teams, quality circles and trouble-shooting teams that create learning in organisations through interactions. (6) *Bureaucratic learning*

systems: this includes an elaborate system of procedures and regulations that give exact advice for specific situations.

Although various researchers have propounded different views as to what constitutes organisational learning (Shrivastava, 1983), closer inspection of this notion reveals that organisational learning is a process that creates new knowledge and skills for individuals. Researchers (Kim, 1993; Nonaka, 1991; Senge, 1990) have posited that an organisation learns through its individual members and consequently that organisational learning is shaped by individual learning. Thus, it is emphasised that the more individuals learn, the more likely are their organisations to attain success. However, researchers share the basic assumption that organisational learning is more than the sum of all individual learning activities and that it is cumulative (Argyris, 1993).

2.2.3 ELEMENTS OF ORGANISATIONAL LEARNING

Several researchers (Nevis, DiBella, & Gould, 1995; Shrivastava, 1983; Templeton et al., 2002) have identified a variety of elements in organisational learning. However, synthesising the literature, Huber (1991) and Templeton et al. (2002) proposed four inter-related elements of organisational learning: *knowledge acquisition, information dissemination, information interpretation* and *organisational memory*. Knowledge acquisition is the process by which knowledge is obtained. The knowledge/information may be obtained from a vast range of sources including customer surveys, research and development activities, performance reviews, scanning the organisational environment, analysing competitors' products, internal and external networks (Huber, 1991; Nevis et al., 1995) and employee training and development programs (Garvin, 1993; Habbershon & Williams, 1999; Paul, 1994). Thus, with the knowledge acquired, there is a potential

for organisations to learn how to improve and innovate their products/services and processes, leading to competitive advantage.

Second, information dissemination is a process by which information from different sources is shared, leading to new information or understandings (Huber, 1991). In this process, information is distributed through the organisation which actually facilitates knowledge sharing among the employees. Some examples of knowledge sharing include staff development (Goh, 1998), environmental scanning (Habbershon & Williams, 1999; Shrivastava, 1983; Wang, 2008), strategic planning, networking and communication (Habbershon & Williams, 1999; Shrivastava, 1983). In addition, information dissemination provides an opportunity for organisations to learn from the experience of others (Argote & Ingram, 2000). A growing body of literature indicates that organisations which are proficient at knowledge transfer are more likely to be more productive and innovative than those which are less adept (Argote, Ingram, Levine, & Moreland, 2000; Darr, Argote, & Epple, 1995).

Third, information interpretation is a process by which distributed information is given one or more commonly understood interpretations (Huber, 1991). This process involves organisational members conceptualising the information that is distributed. Information interpretation is synonymous with Senge's (1990) construct of building a shared vision, where a firm's vision is to be shared with every organisational member so that the organisation can learn.

Finally, organisational memory is a means by which knowledge is stored for future use. Organisational memory is important to learning because without memory learning

would have a short life due to employee turnover and the passage of time (Huber, 1991; Levitt & March, 1988).

Our review of extant literature on organisational learning with special reference to knowledge acquisition, interpretation and dissemination of information and organisational memory has resulted in recognising three major sources of creating, accumulating and sharing knowledge in organisations: *commitment to learning, shared vision* and *networking*. They are used in operationalising the organizational learning construct in this study.

Overall, researchers consider that organisational learning creates new knowledge and skills which are key strategic resources (De Geus, 1988; Grant, 1996b; Nonaka, 1991), which have the capacity to enhance firms' innovations (Baker & Sinkula, 1999; Bates & Khasawneh, 2005; Calantone et al., 2002; Chirico, 2008; Huber, 1998; Hurley & Hult, 1998) and performance (Baker & Sinkula, 1999; Calantone et al. 2002; Craig & Dibrell, 2006; Damanpour & Evan, 1984, Rothwell, 1992). Moreover, it has been acknowledged that organisational learning depends on practices and routines, patterns of interaction both within and outside the firm, and the ability to mobilise individual tacit knowledge and promote interaction. Such learning can be encouraged through careful design of practices, routines and relationships, or through a more flexible, fluid organisation in which individuals are encouraged to develop new ideas and ways of doing things. Researchers argue that learning means integrating new knowledge or mixing existing knowledge in different ways, and then learning leads to newness and thus to innovation. They highlight the convergence between knowledge and innovativeness, suggesting that organisational learning may be a close relative of organisational innovation (Hurley & Hult, 1998; Kieser & Koch, 2008). That is, higher levels of innovation are associated

with cultures that promote learning. Moreover, some suggest that innovation is a by-product of organisational learning (Daryl, 1992; Therin, 2002).

2.3 ORGANISATIONAL INNOVATION

2.3.1 OVERVIEW OF INNOVATION

Academic interest in innovation has been apparent since 1928 with Schumpeter's seminal work on *the instability of capitalism*, which underlined innovation as the driving force of capitalism. Since then subsequent authors (Abernathy & Clarke, 1985; Damanpour, 1991; Tidd et al., 2001) have used the context of economic entities to explore the concept of innovation, and have supported the proposition that innovation has a direct impact on firm performance. Overall, innovation provides organisations with a means of adapting to the changing environment (Greve, 2007; Thompson, 1965), and is often critical for firm longevity and success.

The field of innovation is broad, complex and subject to different interpretations within its different strands (Damanpour, 1991; Wolfe, 1994). The organisational design literature focuses predominantly on the link between structural forms and the propensity of an organisation to innovate (Kimberly & Evanisko, 1981; Mintzberg, 1979). In this strand the unit of analysis is the organisation, and the researcher's main purpose is to identify and explore the structural characteristics that impact on organisational innovation. Scholars of organisational learning (Argyris & Schon, 1978; Baker & Sinkula, 1999; Hurley & Hult, 1998; Nonaka, 1994), on the other hand, tend to focus on how organisations develop new ideas for problem solving and organisational renewal. They consider that organisational innovation is associated with the learning and organisational knowledge creation processes. Research centres on organisational change

and adaptation, and the significance of creating new organisational forms to enhance the innovativeness of the organisation (Hannan & Freeman, 1984). Craig and Moores (2006) underlined that capability in innovation management develops over time and must involve a process of continual learning. Researchers view innovation as a dynamic process in which knowledge and skills are accumulated through learning and interaction. The present study also embodies the view that learning has an impact on organisational innovation in family SMEs and consequently, generates better firm performance.

2.3.2 DEFINING INNOVATION

2.3.2.1 THEORETICAL DEFINITIONS

The term innovation comes from the Latin *innovare,* meaning "to make something new" (Tidd et al., 2001). Indeed, the idea of newness is included in some form in all definitions of innovation. For example, Thompson (1965) defined innovation as the generation, acceptance, and implementation of new ideas, processes, products or services. Damanpour (1991) defined innovation as the generation, development, and implementation of new ideas or behaviours which can be a new product or service, a new production process, a new structure or administrative system, or a new program pertaining to organisational members. Rogers (1998) defined innovation as the application of new ideas to the product, process or any other aspect of a firm's activities. According to Drucker (2002), innovation is a specific function of entrepreneurship, the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth. Dibrell, Davis and Craig (2008) underlined that innovations vary in complexity and can range from

minor changes to existing products, processes, or services to breakthrough products, and to processes or services that introduce first-time features or exceptional performance.

Overall, these definitions underscore that innovation can come in a variety of forms such as products, services, and processes, with a face of newness and/or improvement. However, the use of terms such as “new” or “improved” retains a degree of subjectivity in the notion of innovation. What is new to one firm is not necessarily new to another; therefore it is possible that the innovation in two different firms is not identical. This observation emphasises the degree of complexity associated with the term.

2.3.2.2 TECHNICAL DEFINITIONS

Besides the theoretical definitions, examination of the technical definitions of innovation helps us understand how different institutions interpret the concept of innovation for their policy-making and administrative purposes. In this context, the definition of innovation put forwarded by the Organisation for Economic Co-operation and Development (OECD) is widely used in measuring and interpreting the innovative initiatives, particularly in the OECD countries. The OECD (2005) defined innovation as the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. The OCED identified four types of innovation: product, process, marketing and organisational. *Product innovation* is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user-friendliness or other functional characteristics. *Process innovation* refers to the implementation of a new or significantly improved production or delivery method. This includes significant

changes in techniques, equipment and/or software. Process innovation can be intended to decrease unit costs of production or delivery, to increase quality, or to produce or deliver new or significantly improved products. *Marketing innovation* relates to the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing. Finally, *organisational innovation* concerns the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations.

As the current study is undertaken in the Australian context, clarification of its definitions is worthwhile. The Australian Bureau of Statistics (ABS), Australia's national statistical agency, defines innovation as the process of introducing new or significantly improved goods or services and/or implementing new or significantly improved processes. New goods or services or processes may involve the development of new technology, an adaptation of existing technology to a new use, or it may be non-technological in nature (ABS, 2006). One of the key strengths of this definition is its close connection to the OECD definition of innovation. The Department of Industry, Science and Tourism (DIST) uses a relatively broad definition of innovation: at the level of an individual firm, innovation might be defined as the application of ideas that are new to the firm, whether the new ideas are embodied in products, processes or services or in work organisation, management or marketing. The Business Council of Australia (BCA), an association of the CEOs of Australia's leading corporations, defines innovation as creating or doing new things or doing things in new or better ways, drawing on knowledge, creativity and collaboration to add value to products, services and processes (BCA, 2007, p.34). Although different institutions have defined

innovation in different ways, a common thread in these definitions is the idea of creating new/improved products, services or processes.

As data for this research is obtained from the Business Longitudinal Survey (BLS) conducted by the ABS, its definition of innovation is used in this research in operationalising the conceptualised framework.

2.3.3 TYPES OF INNOVATION

Researchers have argued that distinguishing types of innovation is necessary for understanding organisations' adaptation behaviour and identifying the determinants of innovation (Damanpour, 1991). In early literature in the field, Schumpeter (1934) outlined five categories of innovation: (a) introduction of a new product or an improvement to an existing product, (b) introduction of a new process or an improvement to an existing process, (c) opening of a new market, (d) development of new sources of supply for raw materials or other inputs, and (e) changes in industrial organisation both inter-organisational and intra-organisational, such as the creation of a monopoly firm or a change in management structure. The categorisation of innovation proposed by Abernathy and Clark (1985) has four different modes: (a) *architectural* – new technology that departs from established systems of production, and in turn opens up new linkages to markets and users, characteristic of the creation of new industries as well as the reformation of old ones, (b) *niche* – opening new market opportunities through the use of existing technology, (c) *regular* – involving change that builds on established technical and production competence and is applied to existing markets and customers, and (d) *revolutionary* – innovations which tend to disrupt or make obsolete existing paradigms or technologies in an industry.

On the basis of the perceived extent of change created by innovation, Tidd et al. (2001) identified three types of innovation: (a) *transformational* - when an organisation does something fundamentally different, applying revolutionary new technology or processes to change the organisation, (b) *radical* - transforming the relationship between customers and suppliers, restructuring marketplace economics, displacing current products and creating entirely new product categories (Salomo, Gemunden, & Leifer, 2007), and (c) *incremental* - when standard technology is applied in new ways, as in process improvements, or when best-of-breed technologies are used in innovative ways, bringing better products or services by listening to customers. In Schumpeter's view, radical innovation creates major disruptive changes, whereas incremental innovation continuously advances the process of change. The matrix of change presented by Tidd et al. is based on two forms: the first is the "things", the products or services which an organisation offers, and the second is the change in the way in which the product is created and delivered; that is, the process. Damanpour (1991) maintains that among numerous typologies of innovation advanced in the literature, three have gained most attention: (a) *administrative and technical,* (b) *product and process,* and (c) *radical and incremental*. Whereas an administrative innovation relates to management oriented processes such as structure, human resource management, and accounting systems, a technical (or technological) innovation is directly related to the production of a product using new or upgraded technology. Product innovations are outputs of the organisation. A process innovation assists the organisation to produce products or services (outputs) from inputs. On a continuum, innovation can be described as incremental to radical, according to the degree of change required to implement the innovation.

2.3.4 FACTORS INFLUENCING INNOVATION

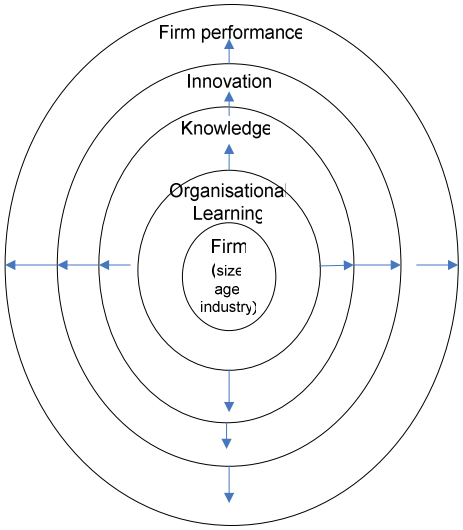
Innovation in an organisation is influenced by many factors (Damanpour, 1991) including both environmental and organisational (Kim, 1980; Kimberly & Evanisko, 1981; Mohr, 1969). Kimberly and Evanisko maintain that an environmental factor such as industry type has a significant effect on innovation. Studies report contradictory results relating to firm size and innovation. Some researchers (Cohen & Kleppler, 1996a; Kimberly & Evanisko, 1981) have found that organisation size positively affects innovation, yet others (Holmstrom, 1989; Martinez-Ros & Labeaga, 2002) have reported no significant relationship between firm size and innovation. Several researchers (Ahmed, 1998; Bhattacharya & Bloch, 2004; Damanpour, 1991; Laursen & Foss, 2003) have identified a number of organisational factors that correlate with the adoption of innovation. Table 2.3 presents reported relationships between organisational factors and innovation.

TABLE 2-3 RELATIONSHIP BETWEEN ORGANISATIONAL FACTORS AND INNOVATION

Independent Variables	Relationship	Author(s)
Specialisation, functional differentiation, professionalism, managerial attitudes toward change, technical knowledge resources, administrative intensity, slack resources, external and internal communication	Positive	Damanpour (1991)
Formalisation	Negative	
Research and development	Positive	Bhattacharya & Bloch (2004)
Organisational learning	Positive	Baker & Sinkula (1999), Calantone et al. (2002), Huber (1998), Hurley & Hutt (1998), Mavondo et al.(2005), Therin (2002)

Researchers (Baker & Sinkula, 1999; Calantone et al., 2002; Huber, 1998; Hurley & Hult, 1998; Therin, 2002) have also investigated the relationship between organisational learning and innovation and have shown that organisational learning is positively related to innovation. This relationship is vital since organisational learning can ultimately result in better performance via innovation, as demonstrated by Olsen, Lee and Hodgkinson (2006) (see Figure 2.1).

FIGURE 2-1 THE RIPPLE-EFFECT MODEL OF ORGANISATIONAL LEARNING, INNOVATION AND FIRM PERFORMANCE



Source: Olsen et al. (2006), p. 17

We next discuss the context in which this study is based, the family business.

2.4 FAMILY BUSINESSES

2.4.1 SIGNIFICANCE OF FAMILY BUSINESSES AND FAMILY BUSINESS RESEARCH

Family businesses are the oldest form of business in the world. The study of family businesses has attracted significant attention in recent times because of their prevalence in the global economic and business landscape (Daily & Dollinger, 1993; Gomez-Mejia, Haynes, Nunez-Nickel, Jacobson, & Moyano-Fuentes, 2007; Moores & Mula, 2000; Morck & Yeung, 2004a). Their role in the economy is significant in terms of employment generation, wealth creation and industrialisation. Studies (Miller, Steier, & Le Breton-Miller, 2003) suggest, based on conservative estimates, that more than 75% of all businesses in most economies are family owned. Table 2.4 shows the estimated percentages of family businesses in selected countries.

TABLE 2-4 FAMILY BUSINESS IN SELECTED COUNTRIES

Country /Region	% of Family Businesses Among All Businesses
North America	US 95% and Mexico 80% (Bournheim, 2000, as cited in the EMCC[3] 2002, p. 8).
Europe	UK 75%, Portugal 70%, Spain 80%, Switzerland 85%, Sweden more than 90%, Italy more than 95% (Neubauer & Lank, 1998, p. 10), Netherlands 52% and Austria 80% (Bournheim, 2000, as cited in the EMCC, 2002, p. 8).
Middle-East	More than 90% (Neubauer & Lank, 1998, p. 10).
East Asia	More than 50% (Tsai, Hung, Kuo, & Kuo, 2006).

[3] European Monitoring Centre on Change.

Moreover, Carlson, Upton and Seaman (2006) reported that 60% of all employment, 78% of all new jobs, more than 50% of GDP and about 65% of all wages paid in the US were from family firms. The PricewaterhouseCoopers family business survey 2007/08 revealed that family businesses contributed up to 65% of the GNP of EU member states, up to 45% of the GNP of North America, up to 70% of the GNP of Latin America and up to 82 % of the GNP of Asia (PwC, 2008). Similar contribution prevails in Australia (see Section 2.4.4).

In spite of the fact that family firms have been in existence and operating for thousands of years as the backbone of economies, it was not until the 1990s that the field was recognised as a separate discipline for scholarly inquiry (Bird et al., 2002). As a result the literature on family firms is not as voluminous as in other areas of management and, more importantly, there are many potential areas for academic scrutiny (Neubauer & Lank, 1998; Ramona, Hoy, Poutziouris, & Steier, 2008). Some have argued (Birdthistle & Fleming, 2005; Wortman, 1994) that because of the lack of a unified paradigm and the concentration on a small segment of the field such as succession, governance and sibling rivalry, research on family firms has not progressed as rapidly or systematically as it could have.

However, after the 1990s, researchers began to recognise family business as a separate discipline and began to build a body of knowledge that expanded understanding of this domain. A significant landmark in family business research was the launching of *Family Business Review* in 1988, a scholarly journal targeting a multidisciplinary audience, by the Family Firm Institute, USA. This breakthrough encouraged more academics to conduct research and publish new knowledge for the field (Sharma, Hoy, Astrachan, & Koiranen, 2007). Although in recent years researchers have made a notable contribution

to establishing a body of knowledge in the family business domain through systematic and rigorous research, the field is still young and emergent, and much remains to be done (Chrisman, Chua, & Sharma, 2005; Sharma, 2004).

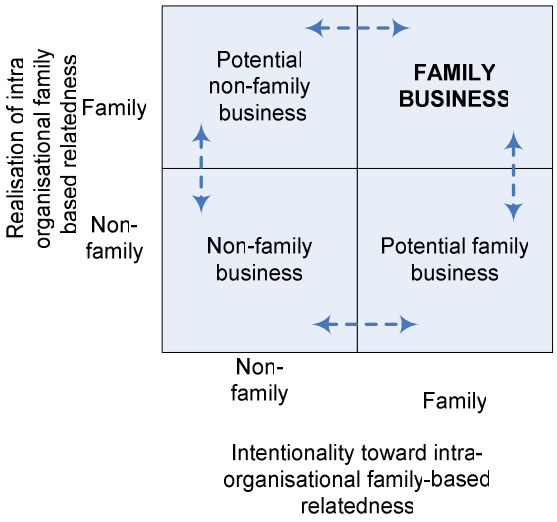
2.4.2 DEFINING FAMILY FIRMS

Although it is recognised that family firms are different from non-family firms (Daily & Dollinger, 1993; Sharma et al., 1997), there is no common agreement in the literature as to what the term *family firm* actually means. Researchers have used different criteria in defining a family firm (Martos, 2007; Wortman, 1994). For example, Robert and Brockhaus (1994) suggested that a family firm is any in which more than one member of the family is affected by business decisions. Daily and Dollinger (1993) attempted to define family firms in terms of firm size, considering family firms as synonymous with small firms. The scanning of family firms' biographies shows that they range from small corner shops to multinational family-controlled enterprises (Birley, Dennis, & Godfrey, 1999). However, overall most family firms fall into the category of small and medium sized firms (SMEs) (Voordeckers, Van Gils, & Heuvel, 2007). Recognising the diversity of family firms, Handler (1989) highlighted the importance of concentrating on the range of family business configurations when defining the family firm.

Litz (1995) identified two main approaches to defining family firms, a *structure-based approach* (intra-organisational family-based relatedness) and an *intention-based approach*. Whereas the structure-based approach considers family firms in terms of firm ownership and management, the intention-based approach focuses on the realised and unrealised value preferences of the organisation's upper echelons and family members. Litz remarked that an obvious shortcoming of the structure-based approach is its inability to appreciate intra-organisational preferences toward family-based relatedness.

Integrating these two approaches, Litz proposed that a business firm may be considered a family business to the extent that its ownership and management are concentrated within a family unit, and to the extent that its members strive to achieve and/or maintain intra-organisational family-based relatedness (see Figure 2.2).

FIGURE 2-2 AN INTENTION-BASED APPROACH



Source: Litz (1995), p. 77

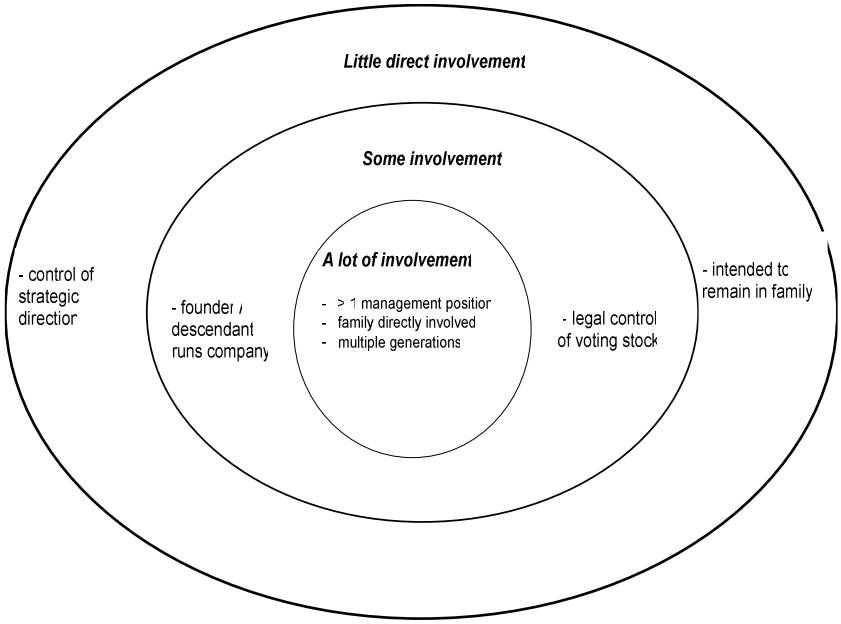
The *components-of-involvement* and *essence* approaches proposed by Chrisman et al. (2005) for defining a family firm can be viewed as a further extension to the Litz approaches. However, in their components-of-involvement approach, Chrisman et al. view family involvement as a sufficient condition for defining family firms. On the other hand, in the essence approach they suggest that mere family involvement is not enough to consider a firm as a family firm; family involvement needs to be directed toward behaviour that produces a certain distinctiveness for a firm to be considered a family firm. It seems that approaches based on family involvement are more favoured by researchers than behavioural approaches (e.g. intention-based and essence approaches) in defining a family firm, as they are easier to operationalise (Chua, Chrisman, &

Sharma, 1999). However, a behaviourally based approach is essential to study the phenomena of family businesses and to understand why and how they differ from other types of business. In this light, both approaches are equally important to researchers in expanding the body of knowledge in the field of family business.

Addressing the definitional debate, Shanker and Astrachan (1996) were among the first to suggest that family firms fall on a continuum rather than belonging to a dichotomous category. They argued that family firms could be categorised according to the degree of family involvement: *little direct family involvement, some family involvement* and *a lot of family involvement*, and these degrees of involvement could be used to group family firm definitions as *broad, middle* and *narrow*.

The *broad* definition indicates little direct family involvement, where the family has some degree of effective control over strategic direction, and the business is at least intended to remain in the family. This definition implies that the family is not involved in the day-to-day operations of the business but influences decision making, perhaps through board membership and/or significant stock ownership. The *middle* definition indicates some family involvement; it includes all the criteria in the broad group in addition to requiring a family member(s) to be directly involved in the day-to-day operations of the business and requiring that the founder, or a descendant, runs the business. The *narrow* definition indicates high family involvement. It includes all the criteria for the middle definition but also requires that multiple generations are involved in the business, there is direct family involvement in day-to-day operations, and more than one family member has significant management responsibility (Shanker & Astrachan, 1996). Figure 2.3 presents the family business definitions by degree of family involvement as put forward by Shanker and Astrachan.

FIGURE 2-3 FAMILY UNIVERSE BULL'S EYE



Source: Shanker & Astrachan (1996), p. 109.

Applying seven different definitions to 427 unquoted companies in the UK, Westhead and Cowling (1998) found that family business statistics were highly sensitive to the definitions employed. According to their least restrictive definition – *the company is perceived by the chief executive officer (CEO), managing director (MD) or chairman to be a family business* – 78.5% of 427 firms they studied were classified as family firms. However, according to their most restrictive definition – *more than 50% of ordinary voting shares are owned by members of the largest single family group related by blood or marriage, the company is perceived by the CEO, MD or chairman to be a family business, 51% or more of the management team are drawn from the largest family group who owns the company, and the company is owned by second generation or more family members* – only 15% of the firms were family firms. These findings show that differences in research results for family firms may be attributable to *demographic*

sample differences rather than *real* differences. Thus, Shanker and Astrachan (1996) and Westhead and Cowling (1998) underlined that the family business definition used by researchers can affect the sampling and research outcomes.

In defining family business some researchers (Astrachan, Klein, & Smyrnios, 2002; Beckhard & Dyer, 1983; Churchill & Hatten, 1987) have used a uni-dimensional approach whereas others (Litz, 1995; Shanker & Astrachan, 1996; Westhead & Cowling, 1998) have used a multi-dimensional approach. The dimensions frequently used in defining family firms are presented in Table 2.5. These different approaches that exist in the domain of family businesses perhaps give rise to the lack of conceptual clarity. However, although it appears that researchers and academics have not reached consensus as to what exactly a family firm is, there are nevertheless commonalities among most of the definitions. Relating to consensus, the observation of Neubauer and Lank (1998) is relevant here, that little consensus on a definition is common in any young academic discipline like family business. Commonalities in the definitions include percentage of ownership, voting control, power over strategic direction, involvement of multiple generations and active management by family members (Shanker & Astrachan, 1996).

Although it is acknowledged that defining a family business is the first and most obvious challenge facing family business research (Handler, 1989), researchers (Habbershon & Williams, 1999; Tagiuri & Davis, 1996) have commonly accepted that family firms are a unique form of business compared to non-family firms.

TABLE 2-5 AUTHORS WHO HAVE CONTRIBUTED TO DEFINING FAMILY BUSINESS

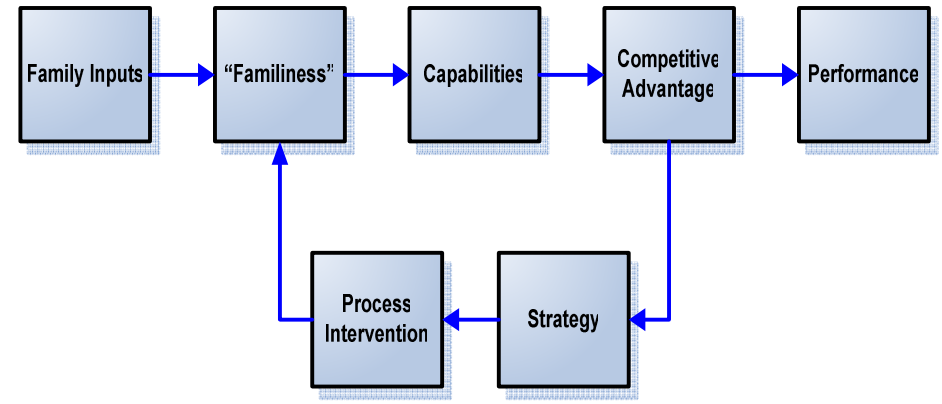
Dimensions	Authors
Uni-dimensional	
Ownership	Barnes & Hershon, 1976; Donckels & Frohlich, 1991; Davis & Harvestion, 1988; Lansberg et al., 1988; Littunen & Hyrsky, 2000
Management	Barry, 1975; Davis & Tagiuri, 1983; Dreux, 1990; Filbeck & Lee, 2000; Ward, 1990
Family involvement	Astrachan et al., 2002; Beckhard & Dyer, 1983; Handler, 1990; Chua et al., 1999; Chrisman et al., 2003; Davis, 1983; Dyer, 2003; Steier, 2001; Upton et al., 2001
Existence of generational handover	Churchill & Hatten, 1987; Donnelly, 1964; Sharma et al., 1997; Tan & Fock, 2001
Multi-dimensional	
Ownership and management	Carsrud, 1994; Corbetta, 1995; Covin, 1994; Donckels & Lambrecht, 1999; Dyer, 1986; Fiegener et al., 1994; Gallo & Sveen, 1991; Ginebra, 1997; Holland & Oliver, 1992; Kelly et al., 2000; Klein, 2000; Leach et al., 1990; Lansberg & Astrachan, 1994; Lank et al., 1994; Lyman, 1991; Pratt & Davis, 1986; Stern, 1986; Rosenblatt et al., 1985; Stavrou & Swiercz, 1998; Shepherd & Zacharakis, 2000; Tsang, 2001, 2002 Westhead & Cowling, 1998; Welsch, 1993.
Ownership, management and an extra dimension	Amat, 1998; Astrachan & Kolenka, 1994; Cabrera & Garcia, 1999; Cadieux et al., 2002; Hall et al, 2001; Handler, 1989; Lea, 1993; Litz, 1995, 1997; Shanker & Astrachan, 1996; Sirmon & Hitt, 2003; Ward, 1987; Westhead et al., 1996

Source: Martos (2007), p. 477.

2.4.3 UNIQUE NATURE OF FAMILY FIRMS

Family firms are a unique species in terms of their resources and capabilities. Many scholars (Chrisman, Sharma, & Taggar, 2007; Chua et al., 1999; Habbershon & Williams, 1999; Habbershon, Williams, & MacMallan, 2003; Shanker & Astrachan, 1996; Sirmon & Hitt, 2003; Tagiuri & Davis, 1996; Wortman, 1994) maintain that family firms' uniqueness arises from family involvement in the business, which has been referred to as familiness. Habbershon and Williams (1999) described familiness as the unique bundle of resources which results from the interaction among the family, individual members and the business itself. They underlined that familiness would help to gain competitive advantage for family firms over non-family firms (see Figure 2.4).

FIGURE 2-4 FAMILINESS AND COMPETITIVE ADVANTAGE

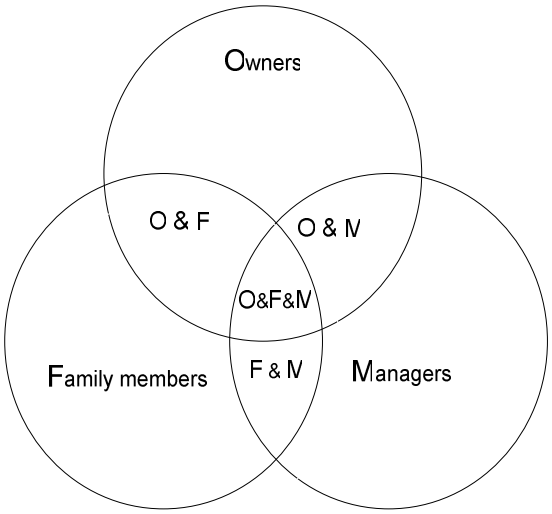


Source: Habbershon & Williams (1999), p. 13.

Family firms are largely influenced by the owning family, whose norms, values, attitudes, and aspirations contribute to shaping the direction of the firm (Sharma et al., 1997). In their bivalent attribute model, Tagiuri and Davis (1996) described how family firms share common characteristics and culture as a result of interacting and overlapping

domains of family, ownership and management. It is acknowledged that these interactions facilitate the transfer of resources across the systems and across generations. Unlike non-family firms, family members in family firms are involved in the business affairs and can therefore influence the business in a number of ways. The literature suggests that family members exert an influence on a business through three overlapping but distinctive systems, *the business, ownership* and *family* (Tagiuri & Davis, 1996, see Figure 2.5). Tagiuri and Davis claimed that the degree to which family and ownership overlap the business systems indicates the degree of influence that a family has over the firm.

FIGURE 2-5 FAMILY BUSINESS SYSTEMS



Source: Tagiuri & Davis (1996), p. 202.

Recognising the owning family's dominant role in the business, Astrachan, Klein and Smyrnios (2002) proposed three dimensions, *power, experience* and *culture*, in what they labelled the F-PEC scale, which captures the family influence in family firms. *Power* refers to dominance exercised through financing the business (e.g., shares held

by the family) and through leading and/or controlling the business through management and/or governance participation by the family. The maximum family influence would be 100% where the family holds all shares, and all management personnel as well as all governance board members are family members. The proportion of shareholdings and the number of family members involved on the management/governance boards affect the degree of influence over the business. *Experience* refers to the summation of experience that the family brings to the business. It is operationalised via the number of generations in charge in ownership and management. *Culture* refers to the values and commitment that the family brings (Astrachan et al., 2002; Klein, Astrachan, & Smyrnios, 2005) to the business. It is argued that if many generations are involved in the business, their influence over the business is higher by virtue of the experience accumulated over the generations.

Highlighting the unique nature of family businesses, some researchers (Habbershon & Williams, 1999; Habbershon et al., 2003) have argued that family firms have a capacity to generate a competitive advantage over non-family firms because of family members' commitment towards a long-term orientation. Furthermore, scholars have contended that a family firm's long-term orientation is backed by family members' shared vision and strong sense of mission (Arregle, Hitt, Sirmon, & Very, 2007; Chua et al., 1999; Le Breton-Miller & Miller, 2006; Ward, 2002), relationship-oriented culture (Miller & Le Breton-Miller, 2005; Stavrou, Kleanthous, & Anastasiou, 2005; Upton, Teal, & Felan, 2001) and the necessity to continue the business as a family economic unit (Miller et al., 2008).

On the other hand, others have argued that the involvement of family members in the firm can give rise to competitive disadvantage as a result of inward-looking strategies

(Colli, 2003; Gallo & Pont, 1996; Robert, 1964), nepotism (Chrisman et al., 2005; Colli, 2003; Robert, 1964), altruism (Chrisman et al., 2005; Schulze, Lubatkin, & Dino, 2003) and entrenchment (Gallo & Vilaseca, 1998; Gomez-Mejia, Nunez-Nickel, & Gutierrez, 2001; Morck & Yeung 2004b). However, collectively researchers are in agreement that the family involvement in family firms has a significant bearing on the firms' strategic direction and continuity.

The next section provides an overview of Australian family businesses, on which this research is based.

2.4.4 FAMILY BUSINESS IN AUSTRALIA

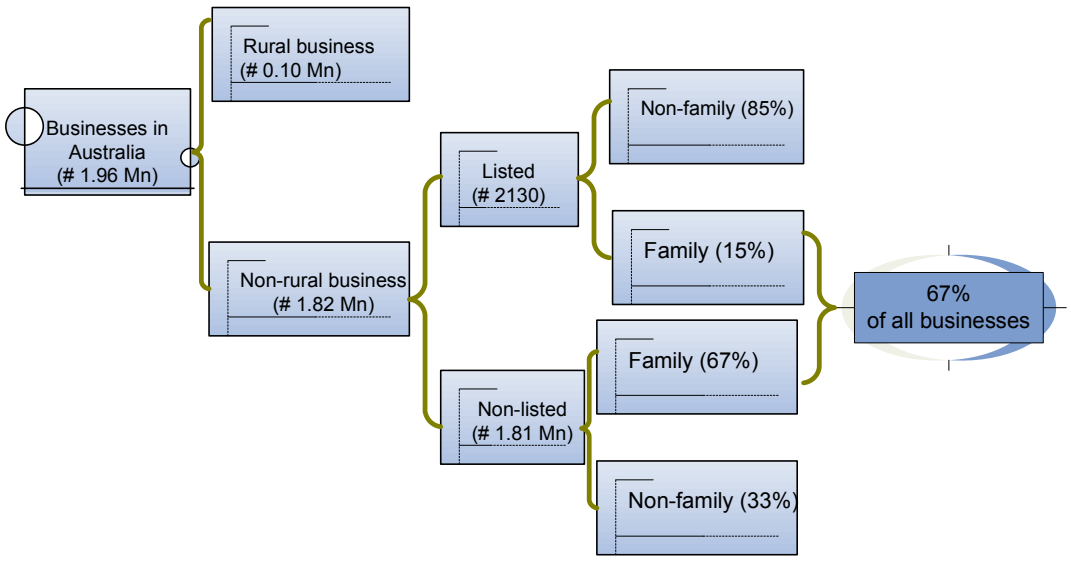
2.4.4.1 INTRODUCTION

Family businesses are significant contributors to the wealth of the Australian economy. Recent national survey findings show that family businesses account for 40% of private sector output and generate more than half of Australia's employment (Smyrnios & Dana, 2006). In addition, it has been estimated that the total wealth of family businesses in 2006 was about A$4.3 trillion, which represents a greater value than the total of the Australian Security Exchange (ASX) market capitalisation of all listed companies plus the total value of all managed funds in Australia (PwC, 2007). Research further indicates that over half of Australia's top 500 private companies are family owned (Smyrnios & Dana, 2006).

A great majority of family businesses are SMEs: however, families can be found in large public companies. Over 97% of all businesses in Australia are SMEs and they employ more than 3.5 million people (Clarke, 2006). It is estimated that about two-thirds of these businesses are family-controlled. Family ownership is common in industries such

as printing, publishing, construction and footwear (Kotey, 2005). Moreover, based on conservative estimates from the Australian Bureau of Statistics' 1997/98 in which a narrow definition is adopted, Moores and Mula (2000) suggest that at least half of all Australian businesses are family-owned. In fact, an examination of companies listed on the ASX based on the criteria of dominant share ownership and presence of founding family member on the board or management as CEO or chairperson has shown that about 15% of publicly-held companies are family-controlled according to the Australian Centre for Family Business (ACFB). Some of these firms are among the world's largest business organisations, examples being Publishing and Broadcasting Ltd. and News Corporation. Figure 2.6 shows the dominance of family businesses in the Australian business arena.

FIGURE 2-6 DOMINANCE OF FAMILY BUSINESSES IN AUSTRALIA



Sources: Australian Bureau of Statistics (2007), Australian Security Exchange (2007), Australian Centre for Family Businesses (2007)

Recognising the significance of family businesses to the Australian economic and business landscape, several initiatives have been taken at institutional level to develop

and promote family business: the establishment of the ACFB [4] and Family Business Australia (FBA)[5] are central in this regard.

2.4.4.2 FAMILY SMES

In studying family SMEs, it is important to understand what SMEs are, because family SMEs are a sub-set of SMEs. However, there is no uniform definition for SMEs either nationally or internationally. They constitute a diverse and dynamic group of enterprises. Given their diversity, most countries use broad definitions to capture the basic characteristics of SMEs. Criteria used include the number of employees, invested capital, turnover and industry type. However, the main criterion that most countries use for statistical purposes is the number of persons employed. Table 2.6 shows examples of international SME definitions in number of employees.

TABLE 2-6 SMES BY NUMBER OF EMPLOYEES

	Small	Medium	Large
European Commission	< 50	< 250	–
United Kingdom	< 50	< 250	250+
Australia	5–19	20–200	200+

Source: Ministry of Economic Development (MOED) New Zealand (2006), p. 35

In this research the ABS definition of SMEs is used to identify Australian SMEs. The ABS (2000a, 2000b) defines SMEs as non-agricultural firms employing more than 4 and

[4] The ACFB (Australian Centre for Family Business) was established in 1994 within the Faculty of Business at Bond University, with the objectives of encouraging family business research and education, and establishing networking opportunities for Australian family firms as a forum for exchanging ideas for improving their businesses.

fewer than 200 people. Thus, for the purpose of this research, a family SME is defined as a firm employing more than 4 and fewer than 200 employees and the following three criteria hold true: (a) owners/managers regard their enterprises as a family firm, (b) 50% or more of the ownership is held by a single family and, (c) at least one director/manager in the firm is from the family. Several researchers (Carsrud, 1994; Cooper, Upton, & Seaman, 2005; Graves & Thomas, 2004; Kotey, 2005; Ram & Holliday, 1993) have argued that the owner-manager's perception of the firm as a family business is an important defining variable even though it contains an element of subjectivity. To eliminate this definitional subjectivity, family members' involvement in management and share ownership are also integrated into the definition in this study. The family business definition used in this study would appear to be located within the "middle definition" of Shanker and Astrachan (1996).

A major challenge for family SMEs throughout the world is maintaining their growth and survival in the competitive environment (Birdthistle & Fleming, 2005; Ward, 1988; Zahra et al., 2008), and this is common to the Australian context as well. Researchers (Chirico, 2008; Dodgson, 1993; Edmondson & Moingeon, 1998; Sinkula et al., 1997) have suggested that organisational learning is one of the strategies that a firm can adopt to cope with these challenges. It is argued that knowledge that comes from organisational learning promotes organisational innovation (Baker & Sinkula, 1999; Calantone et al., 2002; Hurley & Hult, 1998; Salavou et al., 2004; Therin, 2002) whereby firms have the ability to maintain their competitive position. However,

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[5]FBA (Family Business in Australia), a national, member-based, not-for-profit organisation, was established in 1998 with the purpose of improving the effectiveness of Australian family businesses.

organisational learning research has failed to properly consider SMEs, despite a number of researchers suggesting that the capability to learn organisationally is instrumental to the success of SMEs (Anderson & Skinner, 1999; Gibb, 1997). Thus, this study is designed to investigate the relationships between organisational learning, innovation and firm performance in family SMEs. In addition, the same relationships are examined to determine whether family SMEs display any innovation and performance differences from non-family SMEs in light of organisational learning and innovation. From a strategic perspective, the comparison is important to understanding whether the unique attributes of family businesses have a positive impact on the outcomes of firm strategies.

In sum, it can be concluded that organisational learning and innovation are broad and multifaceted concepts and are affected by many factors. Organisational learning studies have shown that creating an organisational environment that promotes learning enhances a firm's innovation and helps a firm to maintain its competitive position. Acknowledging this phenomenon, in the next section, the emergent conceptual framework underlying this research and the research hypotheses are presented to explore the relationships between organisational learning, innovation and firm performance in family SMEs and the intervening effect of innovation between organisational learning and firm performance. Further, hypotheses are developed to examine the effects of organisational learning, innovation and performance between family and non-family SMEs.

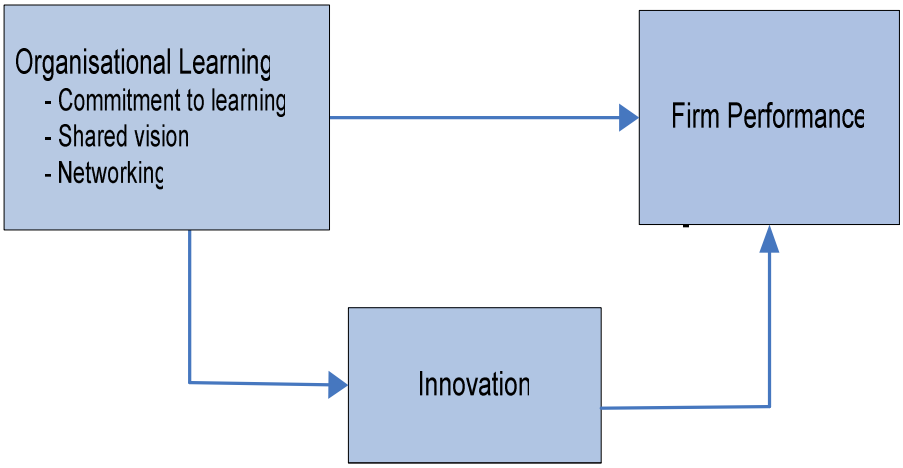
2.5 CONCEPTUAL FRAMEWORK AND HYPOTHESES

2.5.1 INTRODUCTION

The relevance of organisational learning to improving organisational innovation and performance has received considerable attention. Despite the growing interest in

organisational learning on innovation and firm performance, no empirical research has emerged that explores the links between these notions in the context of family SMEs. In this research a conceptual framework is developed to explore the relationships between (a) organisational learning and innovation, (b) organisational learning and firm performance, (c) innovation and firm performance and, (d) the indirect (intervening) effect of innovation between organisational learning and firm performance in family SMEs. In addition, the effects of organisational learning, innovation and firm performance between family and non-family SMEs are also explored. Figure 2.7 presents the conceptual framework of the study.

FIGURE 2-7 CONCEPTUAL FRAMEWORK – ORGANISATIONAL LEARNING, INNOVATION AND FIRM PERFORMANCE



2.5.2 ORGANISATIONAL LEARNING AND INNOVATION

Knowledge and skills are critical to the process of innovation. Numerous researchers (Baker & Sinkula, 1999; Huber, 1998; Kieser & Koch, 2008; Nonaka, 1991) have suggested that a relationship exists between organisational learning and innovation. Stata (1989) maintained that organisational learning is the principal process by which organisational innovation occurs. Similarly, Hurley and Hutt (1998) argued that if

learning is to appear in new behaviour, then organisational learning is synonymous with the capacity to innovate. Further, they found a strong connection between the development of people and the innovativeness of the culture, specifically that the more an organisation encourages members to learn and develop and influence group decisions, the more innovative that organisation is. Moreover, Baker and Sinkula (1999) argued that organisational learning reflects the degree to which firms are committed to systematically changing fundamental beliefs and practices. However, despite the fact that learning (knowledge and skills) is more and more viewed as a central driver of innovation, it is not yet fully understood how these factors affect innovation. For instance, Moorman and Miner (1997) studied the link between existing knowledge and new product innovation and found an insignificant relationship between the two variables.

Although the concept of organisational learning is broad and multifaceted, several researchers have developed a number of instruments to measure it. For example, Goh and Richards (1997) identified five dimensions of organisational learning: clarity of purpose and mission, leadership commitment and empowerment, experimentation, transfer of knowledge, and teamwork and group problem solving. The notion of learning orientation[6], which was developed by Sinkula, Baker and Noordewier (1997) has been used extensively in measuring organisational learning. It includes three dimensions: commitment to learning, open-mindedness and shared vision. Alternatively, Calantone

[6] Habbershon (n.d.) presents a model on how family influence is embedded in six antecedent orientations that have been related to a firm's innovation and how innovation is linked to performance outcomes in a firm. Notably, for this thesis "learning orientation" is postulated as a means by which "familiness" of a firm can impact performance via innovation.

et al. (2002) viewed organisational learning as having aspects of commitment to learning, open-mindedness, shared vision and extra-organisational knowledge sharing. In this research three dimensions are used to explore organisational learning in SMEs. The notions of commitment to learning and shared vision are derived from the work of Sinkula et al. and extra-organisational knowledge sharing, which is here labelled networking, is derived from Calantone et al. However, the measuring variables for these three dimensions in this research are slightly different from their original variables, although conceptually they are closely related[7].

2.5.2.1 COMMITMENT TO LEARNING AND INNOVATION

The first dimension of organisational learning is commitment to learning. Commitment to learning concerns the values placed on learning activities within an organisation, and the extent to which these values are viewed as axiomatic for the firm (Senge, 1990). Employee training, management development, (Mavondo et al., 2005; Nevis et al., 1995; Senge, 1990;1996; Snell & Dean, 1992) and comparison of performance (Shrivastava, 1983, Habbershon & Williams, 1999), also termed "learning culture" (Goh & Richards, 1997; Senge, 1990), are some ways by which firms display their commitment to learning. Particularly employee training and management development have been shown to be associated not only with learning but also with the process of unlearning (Prahalad & Hamel, 1990). Unlearning relates to questioning existing assumptions and beliefs in the organisation; it promotes employees to think rationally and critically. The notion of unlearning is an essential element in organisational

[7] The measurement variables used in this research are employee training, management development, comparison of performance, formal planning and networks.

learning, to develop new ways of thinking and to question the status quo in the organisation. Lopez, Peon and Ordas (2005) underline that human resource development facilitates the creation of new knowledge and insights that encourage employees to question the long-held routines of the firm, with the potential for creating innovation in the firm.

Organisations learn from environmental scanning (Ahituv, Zif, & Machlin, 1998; Albright, 2004; Habbershon & Williams, 1999; Shrivastava, 1983; Wang, 2008). Environmental scanning serves as an impetus for information acquisition and dissemination, an important starting point for learning (Wang, 2008). It broadens a firm's knowledge on internal and external environments, a vital element for succeeding in a competitive market place. In this sense, comparison of performance in an organisation creates new knowledge that eventually has the potential to enhance the firm's capacity for innovation.

In this study, it is proposed that family SMEs which encourage employee training, management development and comparison of performance contribute to enhancing employees' knowledge and skills, whereby innovation is likely to occur. Thus we propose:

Hypothesis 1 Commitment to learning (*H_{1a} - employee training, H_{1b} - management development, and H_{1c} - comparison of performance*) is positively associated with innovation in family SMEs.

2.5.2.2 SHARED VISION AND INNOVATION

The second dimension of organisational learning is shared vision. A shared vision is a destination towards which everybody in the organisation strives (Garvin, 1993; Senge, 1990). It is a common understanding of where people want to go, what they and the organisation want to become. A shared vision aligns people to work towards the same goal, increasing their motivation as they see that everybody else is also working towards that destination. The development of a shared vision is an important step because it fosters a long-term orientation and demonstrates the importance of learning in relation to achievement of the firm's vision (Senge, 1990). It provides an insight into the direction of organisational learning that helps in the understanding of what needs to be learned (Baker & Sinkula, 1999; Calantone et al., 2002; Senge, 1990; Sinkula, 1994). The formal planning process in an organisation is a mechanism for sharing the firm's vision, and planning contributes to directing people towards a common goal. Stata (1989) argued that the benefits that accrue from formal planning are not just the strategies and objectives that emerge, but more importantly the learning that occurs during the planning process. Further, by fostering communication and interaction among all hierarchical levels, the formal planning process helps organisations to acquire and share knowledge (Sadler-Smith et al., 2001), and the knowledge acquired has the potential to enhance organisational innovation. Thus we propose:

Hypothesis 2 Shared vision (*formal planning*) is positively associated with innovation in family SMEs.

2.5.2.3 NETWORKING AND INNOVATION

The third dimension of organisational learning is networking. The impact of sharing knowledge among individuals is notable in the organisational learning literature (Dodgson, 1993; Nevis et al., 1995; Senge, 1990; Stata, 1989). Researchers (Huber, 1991; Levitt & March, 1988) have acknowledged that networking sometimes called external relations, of firms among industry, trade associations and other forms of association create learning by facilitating the sharing of knowledge, providing a means for organisations to learn from the experience of others in the industry. Pittaway, Robertson, Munir, Denyer and Neely (2004) highlight that networks are critical for accessing knowledge to create in-house innovations and also important for learning about innovative work practices that other organisations have developed or adopted. Networks promote social interaction generating trust and reciprocity that are conducive to knowledge transfer. Moreover, studies highlight that firms that do not network possess much lower levels of competence in innovation than firms that do network (Ritter & Gemünden, 2003). However, Harris, Coles and Dickson (2000) found that although inter-firm networking can facilitate the innovation process, it will not necessarily lead to innovation success.

As far as SMEs are concerned, networking activities are of particular importance to them to offset potential fragility engendered by the liability of small organisational size, acting as the key determinant of organisational development. For instance, Nahapiet and Ghoshal (1998) described how networks create favourable conditions for a firm's exchange of knowledge and creation of new knowledge. Further, it has been argued that individual and network contacts may be an important source of new ideas, and networks have also been linked with the number of new opportunities perceived by entrepreneurs

(Arenius, 2005). The rationale is that networks can provide access to knowledge that is not currently possessed, bringing the potential for recognition of opportunities. However, few analyses address the connection between networks and innovation (Chiffoleau, 2005). Thus we propose:

Hypothesis 3 Networking (*external networks*) is positively associated with innovation in family SMEs.

2.5.3 ORGANISATIONAL LEARNING AND FIRM PERFORMANCE

Firm performance is arguably the most important construct in management research. A wide variety of definitions of firm performance have been proposed in the literature (Barney, 2007), with frequent reference to how efficiently and effectively a firm utilises its resources in generating economic outcomes. In the business strategy literature there are two major streams of thought on the determinants of firm performance (Hansen & Wernerfelt, 1989). One is based on factors that exist in the firm's external environment, and the other is based on internal organisational factors. However, most research has highlighted the necessity of concentrating on strengthening internal organisational factors to improve organisational performance, rather than concentrating on external factors, which are often beyond the organisation's control. Performance can be determined in various ways. It might stand for financial performance, market performance, customer performance or overall performance, at least. In this research performance is measured by financially-based performance measures.

Organisational learning impacts on a firm's performance (Baker & Sinkula, 1999; Calantone et al., 2002; Farrell, 1999; Sadler-Smith et al., 2001). Researchers (Nonaka, 1994; Senge, 1990) have addressed the relationship between a firm's organisational learning and its performance, highlighting that learning creates new knowledge which

can help firms respond quickly to customers' needs and industry changes. Baker and Sinkula (1999) and Farrell (2000) found that organisational learning yields promising results in organisations. By empirically testing a model of the antecedents and consequences of organisational learning, Farrell (1999) found that organisational learning has a positive effect on organisational commitment and esprit de corps, and on organisational performance. Using the model developed by Sinkula et al. (1997), Calantone et al. (2002) examined the relationships between organisational learning, firm innovation capability and firm performance in US technology companies. They found a positive relationship between organisational learning and firm performance. In sum, it can be stated that in an environment in which organisational learning is encouraged, individuals will be motivated, encouraged to learn, develop and share new skills and knowledge (Farrell, 1999; Nonaka, 1991), thereby facilitating an improved firm performance. Thus we propose:

Hypothesis 4 Commitment to learning (*$H4_a$ - employee training, $H4_b$ - management development, and $H4_c$ - comparison of performance*) is positively associated with performance in family SMEs.

Hypothesis 5 Shared vision (*formal planning*) is positively associated with performance in family SMEs.

Hypothesis 6 Networking (*external networks*) is positively associated with performance in family SMEs.

2.5.4 INNOVATION AND FIRM PERFORMANCE

Researchers have hypothesised innovation as one possible mechanism by which firms can gain a competitive advantage in the marketplace through unique organisational

resources (Barney, 1991; Damanpour & Evan, 1984). Adoption of an innovation is expected to result in organisational change that might affect the firm's performance (Rothwell, 1992). Research supports the argument that effective innovation serves as a key instrument for firm performance (Baker & Sinkula, 1999; Calantone et al., 2002; Craig & Dibrell, 2006; Damanpour & Evan, 1984). Innovation provides organisations with new means of meeting customers' needs, which can lead to growth in sales and consequently enhance firm performance. Thus we propose:

Hypothesis 7 Innovation is positively associated with performance in family SMEs.

However, although past research has investigated the direct relationship between organisational learning and firm performance and also innovation and firm performance none has empirically tested the indirect (intervening) effect of innovation between organisational learning and firm performance. Teece et al. (1997) highlighted that innovation can also lead to the development of key capabilities that can improve a firm's performance. Thus, it is suggested that organisational innovation might partially affect the relationship between learning and firm performance. Hence, we propose:

Hypothesis 8 The relationship between organisational learning and performance in family SMEs is positively intervened by firm innovation.

2.5.5 ORGANISATIONAL LEARNING, INNOVATION AND FIRM PERFORMANCE: FAMILY AND NON-FAMILY SMES

A key concern in the family business literature is whether family firms differ from non-family firms. Some studies (Daily & Thompson, 1994; Ward, 1988) have not identified any significant difference, whereas others (Gudmundson, Tower, & Hartman, 2003) have found that family firms differ from non-family firms in a number of key areas such

as strategic orientation and innovation. Studies highlight that the long-term nature of ownership (Miller & Le Breton-Miller, 2005; 2006; Zahra, Hayton, & Salvato, 2004), the kinship ties (Ward, 2002; Zahra et al., 2004), the family involvement (Astrachan et al., 2002; Chrisman et al., 2005; Habbershon & Williams, 1999), flexible organisational structures (Birdthistle & Fleming, 2005; Colli, 2003; Menkhoff & Kay, 2000), clan-like cultures (Moores & Barrett, 2002; Moores & Mula, 2000) and trust and enduring relationships (Alpay, Bodur, Yilmaz, Cetinkaya, & Arikan, 2008; Bopaiah, 1998; Gomez-Mejia et al., 2001; Miller & Le Breton-Miller, 2005; Palmer & Barber, 2001) that are unique to family firms allow them to dedicate the resources required for innovation, thereby fostering entrepreneurship and firm performance. Further, some research suggests that family firms could be more innovative and aggressive in their markets due to their relatively smaller size, greater local market knowledge, and relative financial independence compared to very large national companies (McCann, Leon-Guerrero, & Haley, 2001). However, other research has shown that over time some family firms become more conservative (Zahra et al., 2004) or inward-looking (Colli, 2003).

Given the potential differences between family and non-family firms (Sharma et al., 1997), it is important to test empirically whether the impact of organisational learning on innovation and firm performance in family SMEs differs from that in non-family SMEs. We hypothesise that the relationships between organisational learning, innovation and firm performance in family SMEs are stronger than in non-family SMEs because of their distinctive characteristics which can shape strategic choices and processes (Sharma et al., 1997). This investigation will make a contribution to expanding our understanding of differences between family and non-family firms

(Chrisman, Chua, & Sharma, 2003) in terms of strategic orientation and outcomes. To explore the potential differences the following hypotheses are tested in this research:

Hypothesis 9 The relationship between commitment to learning (*H_{9a} - employee training, H_{9b} - management development, and H_{9c} - comparison of performance*) and innovation is stronger in family SMEs than in non-family SMEs.

Hypothesis 10 The relationship between shared vision (*formal planning*) and innovation is stronger in family SMEs than in non-family SMEs.

Hypothesis 11 The relationship between networking (*external networks*) and innovation is stronger in family SMEs than in non-family SMEs.

Hypothesis 12 The relationship between commitment to learning (*H_{12a} - employee training, H_{12b} - management development, and H_{12c} - comparison of performance*) and performance is stronger in family SMEs than in non-family SMEs.

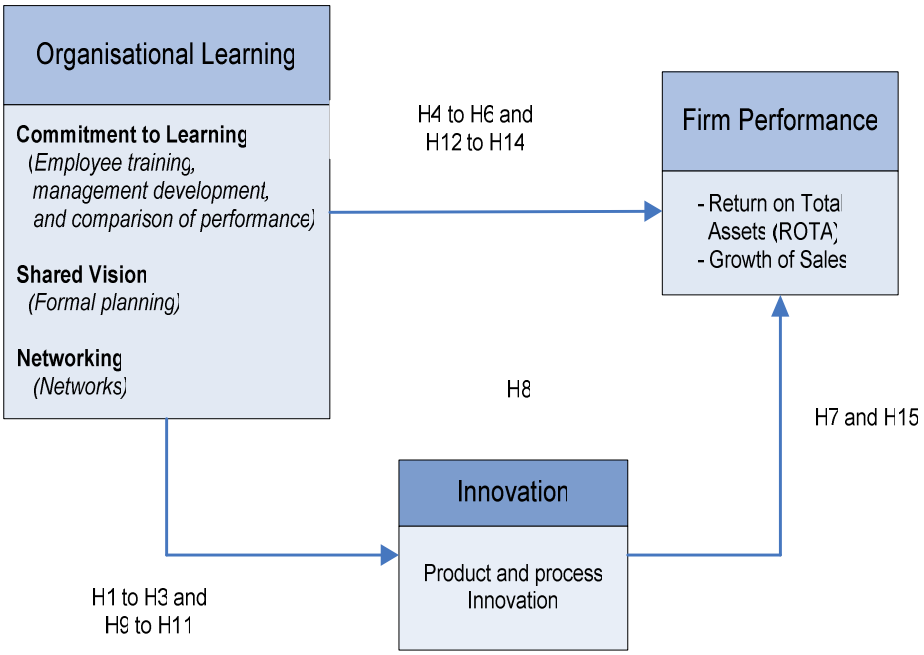
Hypothesis 13 The relationship between shared vision (*formal planning*) and performance is stronger in family SMEs than in non-family SMEs.

Hypothesis 14 The relationship between networking (*external networks*) and performance is stronger in family SMEs than in non-family SMEs.

Hypothesis 15 The relationship between innovation and performance is stronger in family SMEs than in non-family SMEs.

The relationships of the hypotheses developed in this study are depicted in Figure 2.8.

FIGURE 2-8 CONCEPTUAL FRAMEWORK WITH HYPOTHESES



2.6 CHAPTER SUMMARY

In this chapter, the literature pertaining to organisational learning, innovation and family business was reviewed. The importance of organisational learning for innovation and firm performance was highlighted. The study identifies five variables to measure organisational learning: employee training, management development, comparison of performance, formal planning and networks. The first three variables relate to commitment to learning and the fourth relates to shared vision. The fifth variable, involvement with external networks, is used to determine learning from relationships/experience of industry. Subsequently, a conceptual framework was developed and presented to illustrate the associations among organisational learning, innovation and firm performance. Finally, based on the conceptual framework and

previous literature, fifteen main hypotheses were developed, of which eight relate to organisational learning, innovation and firm performance in family SMEs. The final seven hypotheses compare the effects of organisational learning, innovation and firm performance between family and non-family SMEs. The links between the research questions and hypotheses are shown in Table 2.7. The next chapter outlines the research method.

TABLE 2-7 RESEARCH QUESTIONS AND HYPOTHESES

Research Question (RQ)	Hypotheses
RQ – 1: Does organisational learning in family SMEs affect firm innovation?	H_1 Commitment to learning (*H1a - employee training, H1b - management development, and H1c - comparison of performance*) is positively associated with innovation in family SMEs. H_2 Shared vision (*formal planning*) is positively associated with innovation in family SMEs. H_3 Networking (*external networks*) is positively associated with innovation in family SMEs.
RQ – 2: Does organisational learning in family SMEs affect firm performance?	H_4 Commitment to learning (*H4a - employee training, H4b - management development, and H4c - comparison of performance*) is positively associated with performance in family SMEs. H_5 Shared vision (*formal planning*) is positively associated with performance in family SMEs. H_6 Networking (*external networks*) is positively associated with performance in family SMEs
RQ – 3: (a) Does innovation in family SMEs affect firm performance? and, (b) Is the relationship between organisational learning and firm performance intervened by	H_7 Innovation is positively associated with performance in family SMEs. H_8 The relationship between organisational learning and performance in family SMEs is positively intervened by firm innovation.

innovation?	

RQ – 4: Do these relationships and patterns in family SMEs differ from those in non-family SMEs?	H_9 The relationship between commitment to learning (*H9a - employee training, H9b - management development, and H9c - comparison of performance*) and innovation is stronger in family SMEs than in non-family SMEs. H_{10} The relationship between shared vision (*formal planning*) and innovation is stronger in family SMEs than in non-family SMEs H_{11} The relationship between networking (*external networks*) and innovation is stronger in family SMEs than in non-family SMEs. H_{12} The relationship between commitment to learning (*H12a - employee training, H12b - management development, and H12c - comparison of performance*) and performance is stronger in family SMEs than in non-family SMEs. H_{13} The relationship between shared vision (*formal planning*) and performance is stronger in family SMEs than in non-family SMEs. H_{14} The relationship between networking (*external networks*) and performance is stronger in family SMEs than in non-family SMEs. *H_{15}* The relationship between innovation and performance is stronger in family SMEs than in non-family SMEs.

CHAPTER THREE

3. RESEARCH METHOD

3.1 INTRODUCTION

The previous chapter described organisational learning and its likely impacts on innovation and firm performance, and then developed a conceptual framework and testable hypotheses. The present chapter outlines the research method used to empirically test the hypotheses addressing the research questions posed in the first chapter. This chapter consists of four sections including this introduction. Section 3.2 details the research design, which includes data collection, sample selection and operationalisation of the variables. Section 3.3 details the statistical techniques employed in the research. Section 3.4 presents the chapter summary.

3.2 THE RESEARCH DESIGN

3.2.1 DATA COLLECTION – BUSINESS LONGITUDINAL SURVEY

The data employed in this research were drawn from the Business Longitudinal Survey (BLS) conducted by the Australian Bureau of Statistics (ABS) on behalf of the federal government over the four financial years 1994/95 to 1997/98. The ABS designed this survey with the objectives of providing information on the growth and performance of Australian employing businesses and identifying selected economic and structural characteristics of these businesses (ABS, 2000a, p.2). The scope of the BLS is all employing industries in Australia excluding agriculture, forestry and fishing (ANZSIC[8]

[8] Australian and New Zealand Standard Industrial Classification.

division A), electricity, gas and water supply (ANZSIC division D), communication services (ANZSIC division J), government administration and defence (ANZSIC division M), education (ANZSIC division N), health and community services (ANZSIC division O), other services (ANZSIC subdivision 96), private households employing staff (ANZSIC subdivision 97), and libraries, museums, and parks and gardens (ANZSIC groups 921, 922 and 923)(ABS, 2000a , p.3).

The ABS Business Register was used as the population frame for the survey, with approximately 13,000 business units being selected for inclusion in the 1994/95 survey. For the 1995/96 survey, a sub-sample of 4,700 firms (Dockery, 2001) from the original selections for 1994/95 was selected and this was supplemented with a sample of new business units added to the ABS Business Register during 1995/96. The sample for the 1996/97 survey was again in two parts. The first formed the longitudinal or continuing part of the sample, consisting of all the remaining live business units from the 1995/96 survey, and the second part was a sample of new business units added to the ABS Business Register during 1996/97. A similar procedure was followed for the 1997/98 survey. The BLS sample by year and panel status is presented in Table 3.1.

TABLE 3-1 BLS SAMPLE BY YEAR AND PANEL STATUS

	1994/95	1995/96	1996/97	1997/98
Continuing firms	8375	4543	4657	4658
New firms	0	484	409	464
Ceased operating	1	488	371	409
Total sample	8376	5515	5437	5531
Business attrition rate		8.8%	6.8%	7.4%

The BLS is not a completely random sample. The original population (for 1994/95) was stratified by industry and business size. Then, in the second phase of the survey, the

sample was further stratified by innovation status, exporting status and growth status of the business (ABS, 2000a, p.18).

The statistical unit for the survey is referred to by the ABS as the management unit. The management unit is the highest level accounting unit within a business, having regard for industry homogeneity, for which detailed accounts are maintained (ABS, 2000a, p.3). In most cases this unit is the legal entity owning the business (for example, sole proprietorship, partnership, trust, company etc.). In the case of large diversified businesses, however, there may be more than one management unit, each coinciding with a division or line of business.

Data collection in the BLS was achieved through self-administered, structured questionnaires predominantly containing closed questions. Copies of the questionnaires used in each of the four years are not included in the present study but are available from the ABS - http://www.abs.gov.au. The questionnaires were piloted prior to their first use, and were then progressively refined in the light of experience gained in each year of the survey. The survey included ongoing questions as well as one-off questions, in order to collect information relating to matters of policy interest to the federal government at the time of data collection. Various imputation techniques, including matching with other data files available to the ABS, were employed (McMahon, 2001b) to address the issue of missing data in the surveys.

Although some data items collected varied from year to year, most of the items collected fall into the following broad categories:

(i) Background characteristics of the business, such as business locations and activity, including industry, years of operation, legal status, foreign

ownership, family business, managerial experience and qualifications, union membership, employment and employment arrangements

(ii) Business links and networks, including formal and informal information networks

(iii) Business operations, including number of days a business operates, types of business practices, employee training, major changes in business operations, business planning and business intentions

(iv) Innovation, including a measure of whether any type of product/process innovation had been undertaken in the survey year and the amount of expenditure on such innovation

(v) Participation in government programmes such as Export Finance and Insurance Corporation (EFIC) facilities, Austrade programmes, and government employment programmes

(vi) Value and extent of exporting activities

(vii) Use of information technology, including the type and extent of use and for what purposes

(viii) Financial information, including business income, expenditure, profit and loss, assets and liabilities, and equity finance.

To ensure the confidentiality of unit records, the ABS adopted several mechanisms including restricted access to some data (for example, industrial classification, geographical indicators and enterprise age), and omission of some fields from the records (for example, owner's equity, foreign ownership and methods of exporting,

business disputes). Moreover, all financial variables were subject to perturbation, a process in which values are varied slightly to provide further confidentiality protection. That process was applied to each financial variable separately for each year. In addition, firms employing 200 and more than 200 employees, which the ABS categorised as large businesses, were removed from the Confidential Unit Record File (CURF) (Hawke, 2000).

The major strengths of this survey are its information richness, full coverage of the country, response rate over 90% (Hawke, 2000; McMahon, 2001a, 2001b) and longitudinal data. This is one of the few longitudinal surveys of SMEs in the world (Pink & Jamieson, 2000). Concerning its data, the inclusion of financial information of SMEs provides a major strength to this database as financial information of SMEs is hardly accessible to researchers. The significance and relevance of the database to researchers is shown by its considerable use in research (see Appendix B). The BLS is therefore ideal for analysing the important changes, strategies and the status quo of the Australian SME sector (Hawke, 2000).

3.2.2 SAMPLE SELECTION

The BLS data used in this study were included in a Confidential Unit Record File (CURF) released by the ABS on CD-ROM in December, 1999. The CURF contains data on 9,732 business units employing fewer than 200 people, which broadly represents SMEs in the Australian context. The following criteria were used in selecting the sample for the present study:

1. *Legal status* – Only legally incorporated SMEs were selected for the study. The main reason for this selection is that incorporated firms are formally organised

enterprises and are more likely to be growth oriented (Freedman & Godwin, 1994; Hughes & Storey, 1994).

2. *Manufacturing firms* – The research was confined to the manufacturing SMEs of the BLS CURF for several reasons. First, manufacturing SMEs are the major segment of business in the Australian economy according to the BLS. Second, over the last few decades, the performance of Australian manufacturing sector has been a major preoccupation of policy-makers and the federal government (ACCI, 2007; McMahon, 2001b). Moreover, this sector is continually challenged by the volatile economy, growing global competition and changing market conditions (Prime Minister's Science Engineering and Innovation Council, 2007). The Australian and New Zealand Standard Industry Classification (ANZSIC) (2 digit level) was used to identify the manufacturing SMEs in the study. It is reported that on average there were 2,149 manufacturing SMEs in the BLS CURF, representing approximately 35% of all businesses contained in the file.

3. *Presence of all variables in the conceptual model in all four years* – In selecting the years of surveys for the study, there was a need to verify whether all variables included in the model were included in all four years. It was identified that a question relating to networks with other businesses – *one of the variables in this study* – was asked in every BLS except that conducted in 1994/95. Due to absence of the network question in 1994/95, this study limited the analysis to data collected from the financial year surveys 1995/96 to 1997/98 only.

4. *Firm's presence in all three years* – Firms operating in all three years of the study were selected. To ensure that firms included in the study were operational over the three-year period, firms that reported no assets and/or employees and/or no sales in any year were excluded.

5. *Family firms* – The following criteria were used to identify family firms: (a) from the manufacturing SMEs, firms that answered in the affirmative to the Australia Business Survey (BLS) question: "Do you consider this business to be a family business?" and (b) firms in which 50% or more of the ownership was held by a single family; and at least one director in the firm was from that family. Manufacturing SMEs that did not satisfy these criteria were grouped as non-family manufacturing SMEs. Smith (2006) used a similar approach for selecting family controlled manufacturing SMEs in Australia.

Based on these criteria, 222 manufacturing SMEs consisting of 104 family firms and 118 non-family firms were selected for this study. The statistical attributes of the data contained in the BLS and the selected sample are illustrated in detail in Chapter Four.

3.2.3 OPERATIONALISATION OF THE VARIABLES

Several researchers (Gautam & Riitta, 2001; Tsai, 2001) have contended that organisational learning has a lag effect on innovation and firm performance. Similarly, innovation research (Damanpour & Evan, 1984; Tsai, 2001) highlights the lag effect of innovation on firm performance. However, there is no consensus regarding the lag period between organisational learning, innovation and performance, and different studies have used different lag periods based on the data (Tsai, 2001). In this research, we lagged the effect of organisational learning on innovation by one year and the effect

of innovation on firm performance by a further one year, as the data covered only a three year period. In assessing firm performance in the light of innovation, firm performance in the year being analysed was based on the innovation responses in the previous year. Likewise, innovation in the year being analysed was based on the organisational learning responses in the preceding year. Thus, overall firm performance (combining the direct and indirect effects of organisational learning) in the year being analysed was based on the innovation responses in the preceding year and the organisational learning one year before the preceding year. Accordingly, in testing the research hypotheses, firm performance in 1997/98 was regressed with innovation in 1996/97 and with organisational learning in 1995/96.

Mathematically, the relationships discussed above can be expressed as:

$$FP_t = \alpha + \beta\, Inn_{t-1} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$Inn_{t-1} = \upsilon + \gamma\, OL_{t-2} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

$$FP_t = \alpha + \beta\, Inn_{t-1} + \gamma\, OL_{t-2} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

where:

PF_t	=	Firm performance $_{1997/98}$
Inn_{t-1}	=	Innovation $_{1996/97}$
OL_{t-2}	=	Organisational learning $_{1995/1996}$
α and γ	=	Intercepts of respective equations

In testing the hypotheses, this study used (a) performance data from the 1997/98 survey, (b) innovation data from the 1996/97 survey and (c) organisational learning data from

the 1995/96 survey. Appendix C presents the BLS questionnaire items used in this study.

In this section we describe how the independent, intervening, and dependent variables that were illustrated in the conceptual framework are operationalised. In addition, firm size, age and past performance that are likely to control the relationships between constructs in the model are discussed.

3.2.3.1 ORGANISATIONAL LEARNING

Organisational learning is the independent construct in this research. As discussed, Chapter Two identified three organisational learning dimensions: *commitment to learning, shared vision* and *networking*. Commitment to learning is operationalised through three variables: *employee training, management development* and *comparison of performance* of the firm with competitors. Employee training is captured in this study in the form of employee training provided by the firms to their employees. The BLS Likert-type question relating to employee training which included on-the-job training is used to determine the intensity of training. Management development is captured through the Likert-type question in the BLS relating to management training in the firm. In the present study, for the purpose of testing the hypotheses, the responses of these two items are recoded as -1 for a decrease in training, 0 for no change and +1 for an increase in training. Dockery (2001) used a similar approach for recoding the changes in training in his study on training, innovation and business performance titled "An analysis of the Business Longitudinal Survey". The third variable, comparison of performance, is captured by the dichotomous type question in the BLS relating to comparison of firm

performance with competitors. Employee training, management development, and comparison of performance are included in hypotheses H1, H4, H9 and H12.

Shared vision is captured by the presence of formal planning in the firms. To ascertain whether a firm engaged in formal planning, the survey question that asked whether the firm had a formal business plan is used. Firms that had engaged in a formal business plan are coded '1' and firms that did not are coded '0'. The formal planning variable is included in hypotheses H2, H5, H10 and H13.

Networking is captured through the firm's engagement in networking activities. To ascertain whether a firm had been involved in networking activities, the survey question that asked whether the firm had engaged in any formal networks with other firms is used. In this study, networking is a binary variable wherein '1' indicates that the SMEs engaged in networking and '0' otherwise. The networks variable is included in hypotheses H3, H6, H11 and H14.

3.2.3.2 INNOVATION

Innovation is the intervening variable in this research. An intervening variable is one that intervenes in the relationship between the independent and dependent variables, which helps in explaining the influence of the independent variable on the dependent variable (Sekaran, 2003).

As discussed in Chapter Two, innovation in manufacturing SMEs is measured by their product and process innovation intensity. The BLS questions pertaining to innovation (research and development, acquisition of technology (patents, trademarks and licences), expenditure for tooling-up, industrial engineering and start-up, and expenditure on marketing of new or improved products) are used to determine the intensity of product

and process innovation of firms in the sample. Marketing and technology expenditures are also included in the innovation expenditure as they are generally considered to be part of innovation (Olsen et al., 2006; Rogers, 1998). The product and process innovation, as a percentage of output, is computed as follows:

$$\text{P\&P INN} = \left[\frac{(\text{Inn} - \text{Cost})}{\text{Output}}\right] \text{X}100$$

where:

R&P INN = Product and process innovation intensity
Inn-Cost = Innovation expenditure
Output = Output of the firm in the given year.

Dividing the summation of innovation expenditure by output reduces the firm size effect and presents the relative value of process and product innovation intensity. Output in the equation is equivalent to sales plus ending inventory less beginning inventory**.** The process and product innovation variable is included in hypotheses H1-H3, H7-H11 and H15.

3.2.3.3 FIRM PERFORMANCE

As explained in the discussion in Chapter Two, firm performance is the dependent/outcome variable which is the primary interest of the study. Broadly, firm performance can be measured in two forms: *non-financial* and *financial*. Non-financial measures are based chiefly on subjective information provided relevant to the firm's state of affairs, whereas financial measures largely use the firm's accounting information. In this research, a financially-based perspective is used for measuring firm performance, acknowledging the fact that the learning and innovation outcome ultimately leads to attainment of improved financial performance. To operationalise

financially-based performance, return on total assets (ROTA) and growth of sales are employed. In this study ROTA is ascertained as:

$$ROTA = \left[\frac{EBITDA}{TA}\right]$$

where:

ROTA	=	Return on total assets
EBITDA	=	Earnings before interest, tax, depreciation, and amortisation
TA	=	Total assets

The growth of sales is computed as a percentage of changes in sales from year t-1 to t. Firm performance construct is included in hypotheses H4-H8 and H12-H15.

3.2.3.4 CONTROL VARIABLES

Firm size, age and past performance are used as control variables to control firm effects on organisational learning, innovation and performance. However, although industry sector likely affects organisational learning, innovation and firm performance, due to unavailability of data in the BLS relating to industry sector it was not possible to control for this aspect in the present study. As a tool of protecting the confidentiality of the firms included in the database, the ABS does not disclose the specific sector within which each manufacturing firm operates. We recognise this to be a limitation of the present study.

Firm size: Firm size is usually considered to be of importance in the context of the strategic decision-making involved in organisational learning. Child (1972) and Mintzberg (1973) have suggested that firm size affects managerial decisions. The effects of firm size on innovation have been investigated, but the results are mixed. Whereas some researchers (Cohen & Klepper, 1996b; Kimberly & Evanisko, 1981) have reported

a positive effect of firm size on innovation, others (Holmstrom, 1989; Martinez-Ros & Labeaga, 2002) have found a negative effect or no effect at all. In this study, firm size is included as a control variable and is operationalised using the natural logarithm of the firm's total number of employees (Fombrun & Ginsberg, 1990; Karaevli, 2007; Tsai, 2001). A logarithm is used because number of employees is highly skewed among the firms in the study.

Firm age: The study also controls for firm age, considering the fact that older firms might have well-established systems and procedures that promote greater organisational learning than in younger firms. Moreover, the learning curve experience prevailing in older firms provides more opportunity for learning, thereby contributing to improvement in the firm's performance. As far as innovation is concerned, some studies (Calantone et al., 2002; Hansen, 1992; Heunks, 1998; Thornhill, 2006) have highlighted the existence of a relationship between firm age and innovation. Firm age in this study is measured by the number of years the firm had been in existence (Karaevli, 2007). However, the BLS measured firm age using an ordinal variable, reflecting age in three- and five-year intervals from 2 to 20 years, with two single categories for firms greater than 20 years of age and for firms less than 2 years. For firm age therefore, this study utilises five discrete categories and codes them as follows:

Firm Age

Category	Code
< 2 yrs	1
≥ 2 yrs and < 5 yrs	2
≥ 5 yrs and < 10 yrs	3
≥ 10 yrs and < 20 yrs	4
≥ 20 yrs	5

Past performance: Several previous studies (Brush, Philip, & Hendrickx, 2000; Zahra et al., 2004) recognise that firm performance is likely to be influenced by prior performance. Similarly, some studies posit that when a firm performs well, financial slack increases and thus greater opportunities are created for innovation (Herold, Jayaraman, & Narayanaswamy, 2006) and learning (Kotaro, 1998). In this research past performance is included as a control variable to neutralise its effect on organisational learning, innovation and firm performance. Past performance is ascertained averaging the ROTA during the financial years 1995/6 and 1996/7.

In summary, the overall model of the research in mathematical form can be presented as follows:

$$FP_t = \acute{\alpha} + \beta_1\, pro\_pro\_inn_{t-1} + \beta_2\, emp\_tranining_{t-2} + \beta_3\, mgt\_deve_{t-2} + \beta_4\, com\_p_{t-2} + \beta_5 formal\ planning_{t-2} + \beta_6\, networks_{,t-2} + \beta_7\, size_t + \beta_8\, age_t + \beta_9\, p\_per + \acute{\varepsilon}_t$$

where:

FP_t	Firm performance$_{1997/98}$
$\acute{\alpha}$	Intercept
$\beta_1\, pro\_pro\_inn_{t-1}$	Product and process innovation$_{1996/97}$
$\beta_2\, emp\_training_{t-2}$	Employee training$_{1995/96}$
$\beta_3\, mgt\_deve_{t-2}$	Management development$_{1995/96}$
$\beta_4 com\_p_{t-2}$	Comparison of performance$_{1995/1996}$
$\beta_5\, formal\ planning_{t-2}$	Formal planning$_{1995/96}$
$\beta_6\, networks_{t-2}$	Networking$_{1995/96}$
$\beta_7\, size_t$	Firm size$_{1997/98}$
$\beta_8\, age_t$	Firm age $_{1997/98}$
$\beta_9\, p\_per$	Past performance
$\acute{\varepsilon}_t$	Error correction term

3.3 STATISTICAL TECHNIQUES

Statistical techniques are the tools by which researchers analyse data, test research hypotheses, and subsequently refine theories. The hypotheses and the characteristics of the data determine the types of analysis that need to be conducted. With this in mind, two main statistical techniques are used in the research. First, multiple linear regression analysis is used for testing the hypotheses relating to within family SMEs. Second, the Chow test is employed to measure any statistically significant differences in innovation and firm performance between family and non-family SMEs in the light of organisational learning and innovation. In addition, descriptive statistics are used to analyse and interpret the statistical attributes of the population, sample and variables.

3.3.1 MULTIPLE LINEAR REGRESSION ANALYSIS

In this research, multiple linear regression analysis is the principal statistical technique used to test the hypotheses. Multiple linear regression analysis is a general statistical technique used to analyse the relationship between a single dependent variable and several independent variables (Hair, Black, Babin, Anderson, & Tatham, 2006). It is one of the most extensively used multivariate statistical techniques for testing hypotheses and predicting values for dependent variables. However, the purpose of using multiple linear regression analysis here is not to generate a model useful for predicting the performance of family SMEs, but to determine using hypothesis testing whether organisational learning affects firm innovation and firm performance and subsequently whether innovation affects firm performance. Accordingly, the research is designed to allow discussion of the quantitative results of the analysis in light of the significance of

beta coefficients entered into the model, rather than to describe the accuracy and the fitness of the model. The generic form of a multiple linear regression is:

$$Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \ldots\ldots\ldots\ldots + \beta_j X_{ij} + \acute{\varepsilon}_i$$

where y is the dependent variable, X_{i1} , ……, X_{ij} are the independent variables, β_0 is the constant , β_1 ……, β_j are the regression coefficients, notation *i* refers to the *i*th case in the *n* sample of observations, and $\acute{\varepsilon}$ represents an error term.

The underlying assumptions of the linear regression, the linearity, normality and homoscedasticity are tested in continuous data used for the regression analysis. Linearity is the relationship between dependent and independent variables, representing the degree to which change in the dependent variable is constant across the range of values for the independent variable. Linearity is assessed by analysing the scatterplots of the variables. If nonlinearity is detected a data transform technique is used to convert the data into linear format.

The most fundamental assumption in linear regression analysis is normality, which refers to the degree to which the distribution of data corresponds to a normal distribution (Hair et al., 2006). Normality can be checked using a box plot diagram and kurtosis and skewness testing. In this study the kurtosis and skewness are used to detect the normality of the variables. If non-normality is found, a data transformation technique is used to transform the data into normality.

Consistent variance of the error term is associated with homoscedasticity. Homoscedasticity assumes that the dependent variable exhibits equal levels of variance across the range of predictor variables (Hair et al., 2006). Variability affects the standard

error and makes hypothesis testing either too stringent or too insensitive. The Levene test is used to assess whether the variances are equal across any number of groups.

Multicollinearity is another factor that needs to be taken into account in interpreting results, as it distorts the results of the regression. A multicollinearity problem arises when two or more independent variables are linearly related. This situation can be detected by analysing variation inflation factors (VIFs). A VIF value of 1.0 indicates that a variable is orthogonal to all other independent variables, implying that no multicollinearity exists. However, a common rule of thumb to indicate the existence of multicollinearity is a VIF value of 10 or higher (Lomax, 1992).

The framework used in the research shows an indirect relationship between organisational learning and firm performance via innovation. Innovation is the intervening variable in the indirect relationship. Conceptually, intervening variables come between independent and dependent variables and represent the generative mechanism through which the independent variables influence the dependent variable. Baron and Kenny (1986) have discussed how the intervening effect is captured in multiple regression. In this study, a procedure suggested by Baron and Kenny (1986) and Frazier et al. (2004) is used to capture the intervening effect of innovation between organisational learning and firm performance. For this a series of three regression analyses is needed. The first is the regression of the intervening variable (innovation) on the independent variable (organisational learning). The second is the regression of the dependent variable (firm performance) on the independent variable (organisational learning), and the third is the regression of the dependent variable (firm performance) on both the independent (organisational learning) and the intervening (innovation) variables.

As Baron and Kenny (1986) suggested, intervening is established when several conditions are satisfied. First, the independent variable must significantly affect the intervening variable. Second, the independent variable must significantly affect the dependent variable. Third, the intervening variable must significantly affect the dependent variable but the effect of the independent variable on the dependent variable must be less in the third regression than in the second. Moreover, Baron and Kenny posited that the intervening effect is partial when the relation between the independent and dependent variables is significant in the third condition but at a reduced level compared with the second condition. The significance of the intervening effect in this study is measured using the Sobel test.

3.3.2 CHOW TEST

A widely used test for comparing two regression models is the Chow test (Chow, 1960; Liao, 2004). The test determines whether the coefficients in a regression model are the same in separate sub-samples. In this research to determine the significance of the differences across family and non-family SMEs in the effect of organisational learning on innovation and firm performance and innovation on firm performance, the Chow test is used. The equation for the test is:

$$F = \frac{(RSS_R - RSS_{UR})/k}{(RSS_{UR})/(n_1 + n_2 - 2k)} \sim F[k(n_1 + n_2 - 2k)]$$

Where,

RSS_R = the sum of squared residuals from a linear regression in which b_1 and b_2 are assumed to be the same (restricted model).

RSS_{UR} = the sum of squared residuals from a linear regression of sample 1 (RSS1) and sample 2 (RSS2) (Unrestricted model).

n_1 = Sample size – Sample 1

n_2 = Sample size – Sample 2

k = the number of parameters estimated

The SPSS software (version 15) is used for regression analysis and for testing the underlying assumption of linear regression in this research.

3.4 CHAPTER SUMMARY

This chapter outlined the research method used in the study. First, descriptions were presented of data collection, sample selection, and operationalisation of the variables. The features of the BLS were described, the most recent comprehensive longitudinal survey in Australia, data from which was used this research. Finally, the statistical techniques of the research were identified and discussed. The most appropriate techniques were identified as regression analysis and the Chow test. In the following chapter the research hypotheses are tested according to the statistical procedure discussed in the preceding sections, and results are presented and interpreted.

CHAPTER FOUR

4. QUANTITATIVE ANALYSIS AND RESULTS

4.1 INTRODUCTION

The purpose of this chapter is to present and analyse the empirical results of the study. The chapter consists of five sections including this introduction and then proceeds as follows. First, in Section 4.2 the demographic characteristics of the firms in the BLS are presented and described for the purpose of providing background information for the analysis. Section 4.3 presents some selective descriptive statistics of the sampled firms of the study to sketch a general picture of the data used. Section 4.4 reports the results of the hypothesis testing and examines the results. Finally, Section 4.5 presents the chapter summary.

4.2 DEMOGRAPHIC CHARACTERISTICS OF THE FIRMS IN THE BUSINESS LONGITUDINAL SURVEY[9]

4.2.1 INDUSTRY DISTRIBUTION OF FIRMS

As discussed in Chapter Three, the BLS was conducted by the Australian Bureau of Statistics over the financial years 1994/95 to 1997/98 to identify selected economic, managerial and structural characteristics of Australian businesses. The BLS is the first official longitudinal survey of businesses in Australia and one of the few in the world (Pink & Jamieson, 2000). The corpus consists of 9,732 firms[10] employing fewer than 200

[9] Because the demographic characteristics of populations of the BLS are almost identical over years, the results presented in most Tables in Section 4.2 are limited to the 1997/98 survey data only.

[10] 9,732 firms comprised of 8,375 firms in 1994/95 survey; 484 new firms in 1995/96 survey; 409 new firms in 1996/97 survey and 464 new firms in 1997/98 survey.

employees within the industries of mining, manufacturing, construction, wholesale trade, retail trade, accommodation, cafes and restaurants, transport and storage, finance and insurance, property and business services, cultural and recreational services, and personal and other services. Table 4.1 shows that the majority of the firms in the BLS fall into the manufacturing industrial category, which represents approximately 35% of the firms surveyed. The wholesale trade and the property and business services represent the second and third largest industrial categories respectively in the BLS, and mining is the smallest industry category, containing approximately 1% of the firms surveyed. The industry distribution of firms in the BLS based on the ANZSIC is presented in Table 4.1.

TABLE 4-1 INDUSTRY DISTRIBUTION OF FIRMS

Industry	1994/95		1995/96		1996/97		1997/98	
	No.	%	No.	%	No.	%	No.	%
Mining	60	0.7	53	1.1	61	1.2	67	1.3
Manufacturing	3076	36.7	1832	36.4	1804	35.6	1774	34.6
Construction	452	5.4	296	5.9	303	6.0	330	6.4
Wholesale trade	1074	12.8	744	14.8	770	15.2	768	15.0
Retail trade	899	10.7	525	10.4	546	10.8	558	10.9
Accommodation, cafes and restaurants	315	3.8	207	4.1	200	3.9	209	4.1
Transport and storage	340	4.1	198	3.9	198	3.9	202	3.9
Finance and insurance	350	4.2	222	4.4	223	4.4	229	4.5
Property and business services	1397	16.7	718	14.3	722	14.3	737	14.4
Cultural and recreational services	185	2.2	118	2.3	122	2.4	127	2.5
Personal and other services	227	2.7	114	2.3	117	2.3	121	2.4
TOTAL	**8375**	**100**	**5027**	**100**	**5066**	**100**	**5122**	**100**

4.2.2 FIRM SIZE AND AGE

Tables 4.2 and 4.3 provide descriptive statistics pertaining to firm size and age, for all the industrial categories contained in the BLS in the financial year 1997/98. Although there are several alternatives for grouping businesses by size, Table 4.2 provides the number of firms in each industry category in terms of full-time employees. The ABS has also adopted total employment as the basis for classifying non-agricultural businesses by size, and the size categories used in this research are consistent with the ABS business size classifications.

TABLE 4-2 DISTRIBUTION OF FIRMS BY NUMBER OF EMPLOYEES – 1997/98

Industry	FIRMS BY EMPLOYEES				Mean (Employees)
	1 – 4	5 – 19	20 < 200	Total	
Mining	20	21	26	67	**32**
Manufacturing	338	578	858	1774	**32**
Construction	165	104	61	330	**15**
Wholesale trade	143	253	372	768	**35**
Retail trade	143	192	223	558	**34**
Accommodation, cafes and restaurants	53	91	65	209	**34**
Transport and storage	64	75	63	202	**35**
Finance and insurance	120	50	59	229	**36**
Property and business services	278	231	228	737	**35**
Cultural and recreational services	45	36	46	127	**39**
Personal and other services	49	45	27	121	**31**
TOTAL	**1418**	**1676**	**2028**	**5122**	**36**

As Table 4.2 shows, 1,418 firms (27.7%) fell into the category of micro-sized firms on the basis of number of employees; that is, they employed fewer than five people. Firms employing from 5 to 19 people, categorised as small-sized firms, constituted 32.8% of the firms surveyed. Medium-sized firms, employing 20 to 199 people, constituted 39.6% of the firms surveyed. In total, the data show that 72.3% of the firms in the BLS in the financial year 1997/98 were SMEs. Table 4.2 further shows that the mean number of employees of all firms surveyed during the period was 36. However, the construction industry displayed a relatively low mean number of employees (15) compared to other industries. This may be because the construction industry uses "sub contractors", and they are not classified as employees.

Table 4.3 displays the age distribution of firms based on the duration of their existence since foundation. The data show that the majority of firms in the BLS had been in existence for over 10 years, indicating that the survey data are made up of reasonably established firms. For an example, in the 1997/98 survey 55% of firms had been established for over 10 years, 31% between 10 and 19 years and 24% for 20 years or more. Of the 5,122 firms surveyed in 1997/98, only 258 (5%) were less than 2 years old (see Table 4.3).

TABLE 4-3 DISTRIBUTION OF FIRMS BY AGE – 1997/98

Industry	FIRMS BY AGE (IN YEARS)					Total
	< 2	2 –4	5 – 9	10-19	≥ 20	
Mining	9	19	7	19	13	67
Manufacturing	68	218	418	575	495	1774
Construction	17	57	88	100	68	330
Wholesale trade	27	117	146	229	249	768
Retail trade	37	105	159	162	95	558
Accommodation, cafes and restaurants	16	48	54	44	47	209
Transport and storage	8	32	51	60	51	202
Finance and insurance	20	40	46	78	45	229
Property and business services	39	125	202	251	120	737
Cultural and recreational services	8	23	37	35	24	127
Personal and other services	9	22	32	36	22	121
TOTAL	**258**	**806**	**1240**	**1589**	**1229**	**5122**

4.2.3 LEGAL STATUS OF FIRMS

In presenting the legal status of the firms contained in the BLS, Table 4.4 indicates that 66.9% of the firms surveyed were incorporated as companies. Moreover, data illustrate that whereas 75.8% of firms in the manufacturing industry - the industry with the largest number of firms in the BLS - were incorporated, more than 50% of the firms in the retail trade (52.9%), the accommodation, cafes and restaurants (55.5%), and personal and other services (61.2%) industries were unincorporated.

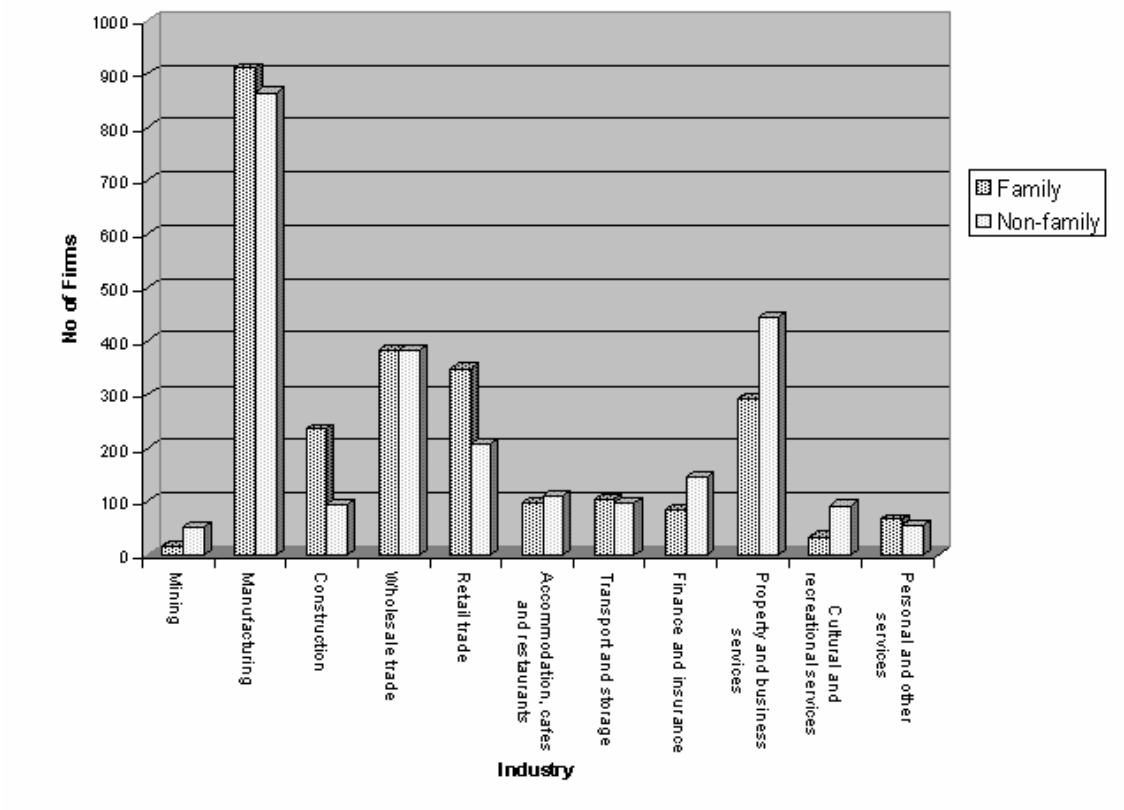
TABLE 4-4 DISTRIBUTION OF FIRMS BY LEGAL STATUS – 1997/98

Industry	FIRMS		
	Incorporated	Unincorporated	Total
Mining	60	7	67
Manufacturing	1344	430	1774
Construction	184	146	330
Wholesale trade	588	180	768
Retail trade	263	295	558
Accommodation, cafes and restaurants	93	116	209
Transport and storage	132	70	202
Finance and insurance	165	64	229
Property and business services	467	270	737
Cultural and recreational services	83	44	127
Personal and other services	47	74	121
TOTAL	**3426**	**1696**	**5122**

4.2.4 OWNERSHIP OF FIRMS

Figure 4.1 illustrates the types of businesses contained in the BLS by form of ownership, based on the survey question that asked "Do you consider this business to be a family business?" The responses show that in total, 50.3% of the firms surveyed in the 1997/98 financial year fell into the category of family ownership. Manufacturing (51.3%), construction (71.5%), retail trade (62.7%), transport and storage (51.5%) and personal and other services (54.5%) industries displayed higher percentages of family ownership than non-family ownership, whereas the mining (22.4%), finance and insurance (36.7%), property and business services (39.6%) and cultural and recreational services (27.6%) industries reported lower percentages of family ownership.

FIGURE 4-1 DISTRIBUTION OF FIRMS BY OWNERSHIP - 1997/98



4.2.5 CONTINUING FIRMS

Although the BLS survey contains data pertaining to 9,732 firms, only 3,864 firms (39.7%) continued operation over all four surveys. The data further show that of the 9,732 firms, about 749 (7.7%) firms appeared active in three surveys, 768 (7.9%) firms appeared active in two surveys and 4,351 (44.7%) firms appeared active in only one survey. For the purposes of the study, only those firms that were active in the last three consecutive surveys were included. Table 4.5 categorises the firms on the basis of frequency of their appearance in the four surveys.

TABLE 4-5 CONTINUING FIRMS

Industry	FIRMS				
	1 year only	2 years only	3 years only	All 4 years	Total
Mining	36	16	16	32	100
Manufacturing	1520	244	238	1427	3429
Construction	240	47	53	225	565
Wholesale trade	442	95	89	615	1241
Retail trade	502	101	85	396	1084
Accommodation, cafes and restaurants	168	43	38	143	392
Transport and storage	194	30	36	143	403
Finance and insurance	193	36	55	148	432
Property and business services	804	111	100	565	1580
Cultural and recreational services	104	23	16	90	233
Personal and other services	148	22	23	80	273
TOTAL	**4351**	**768**	**749**	**3864**	**9732**
	≤ Two years		**≥ Three years**		
Manufacturing	1764		1665		3429
Non-manufacturing	3435		2948		6383
TOTAL	**5199**		**4613**		**9732**

4.3 DESCRIPTIVE STATISTICS OF THE SAMPLED FIRMS

As Table 4.5 displays, of the 4,613 firms contained in the BLS that continued operation for three or more years, 1,665 firms were manufacturing and 2,948 firms, non-manufacturing. In selecting the initial sample for the study, 1994/95 data were removed from the sample. This was done because in the 1994/95 survey the question pertaining to networks, which is one of the variables of interest in the current study, was not

included. In addition, as the focus of this study is on manufacturing firms, non-manufacturing firms were also eliminated. Using these steps, the study initially selected a sample of 1,540 firms from the manufacturing industrial category that had continued operation over the last three surveys, viz 1995/96 – 1997/98 (see Table 4.6).

Moreover, as mentioned in Chapter Three, the study is restricted to legally incorporated manufacturing firms only, on the basis that legally incorporated firms are formally organised firms, which are likely to have growth intentions and are thus suitable for this study. Applying this criterion, Table 4.6 shows that out of the 1,540 manufacturing firms that were initially selected for the sample, 1,187 (77.1%) firms were incorporated. The other 353 firms (22.9%) were identified as unincorporated and were removed from the sample for the study.

TABLE 4-6 CHARACTERISTICS OF SAMPLED FIRMS

Classification	No. of Firms	%
Firm Type		
Manufacturing	1540	36.1
Non-manufacturing	2731	63.9
TOTAL	**4271**	**100**
Legal Status		
Incorporated	1187	77.1
Unincorporated	353	22.9
TOTAL	**1540**	**100**

As defined in this study, firms employing five or more but fewer than 200 employees were categorised as SMEs. In the selection of SMEs for the final sample, firms

employing fewer than five employees (micro-sized firms) were also removed. On the basis of full time employees, Table 4.7 shows that incorporated manufacturing firms in the initial sample comprised 199 (16.8%) micro-sized, 381 (32.1%) small-sized and 607 (51.1%) medium-sized firms. In line with the definition of SMEs used in this study, at this stage 988 firms, comprised of 381 small-sized and 607 medium-sized firms, were selected for further consideration (see Table 4.7).

TABLE 4-7 INCORPORATED SMALL AND MEDIUM-SIZED MANUFACTURING FIRMS

Firm Size	**Incorporated Manufacturing Firms**	
Micro-sized firms *(< 5 employees)*	199	16.8
Small-sized firms *(5 - 19 employees)*	381	32.1
Medium-sized firms *(20 - 199 employees)*	607	51.1
TOTAL	**1187**	**100**
SMEs *(5 - 199 employees)*	**988**	

The 988 firms selected were further scrutinised to identify those which were family businesses, based on the criteria described in Chapter Three, and also to remove firms that had missing data, specially relating to innovation expenditure, to so as to be able to test the hypotheses postulated in Chapter Two. After these screenings 222 manufacturing SMEs (104 family firms and 118 non-family firms), representing 22.5% of the incorporated manufacturing SMEs that were active in the last three surveys, were selected for the study. Table 4.8 shows some descriptive statistics of the final sample.

TABLE 4-8 FAMILY AND NON-FAMILY SMES

Criteria	Family firms		Non-Family firms		Total	
	#	%	#	%	#	%
Firm Size						
Small-sized firms *(5 - 19 employees)*	27	26.0	29	24.6	56	25.2
Medium-sized firms *(20 - 199 employees)*	77	74.0	89	75.4	166	74.8
TOTAL	**104**	**100**	**118**	**100**	**222**	**100**
Mean employees	**42.7**		**50.4**		**46.8**	
Median	**33.5**		**35.5**		**35.0**	
Standard deviation	**33.8**		**43.5**		**39.3**	
Skewness	**1.86**		**1.34**		**1.56**	
Firm Age						
Less than 2 yrs	0	0.0	0	0.0	0	0.0
Between 2 – 4 yrs	3	2.9	9	7.6	12	5.4
Between 5-9 yrs	17	16.3	37	31.4	54	24.3
Between 10-19 yrs	30	28.8	43	36.4	73	32.9
20 yrs and more	54	51.9	29	24.6	83	37.4
TOTAL	**104**	**100**	**118**	**100**	**222**	**100**
Mean age	**12.5**		**7.8**		**10.5**	
Median age	**20**		**10**		**10**	
Standard deviation	**0.85**		**0.90**		**0.91**	

Table 4.8 shows that the mean numbers of employees of family and non-family SMEs were 42.7 (median 33.5) and 50.4 (median 35.5) respectively. In both family and non-family firms, employee distributions were skewed towards the left, indicating that more firms had employee numbers below the mean values. The variability of number of employees of both family and non-family firms was rather high, as indicated by the standard deviations of 33.8 for family and 43.5 for non-family firms.

The age distribution of the firms in the sample is also illustrated in Table 4.8, showing that the majority of firms in both family (80.7%) and non-family (61.0%) categories had been in existence for over 10 years. The descriptive statistics further show that the mean ages of family and non-family manufacturing SMEs were about 12.5 and 7.8 respectively. Whereas the age distribution of non-family firms was normally distributed, in family firms it was skewed towards the right. The median age of family firms was reported as 20 years whereas in non-family firms it was 10 years. The variability of firm age in both family and non-family firms was marginal, as indicated by the standard deviations of 0.85 for family and 0.90 for non-family firms.

Family firms in the sample were further categorised by generation, to provide insight about the generations involved in the business. In the BLS, generation is indicated by the number of family generations involved in the business. Table 4.9 presents the results of this classification. Results indicate that the majority of the family firms belonged to the first and second generations: 39.3% were first generation and 44.0% were second generation firms.

TABLE 4-9 DISTRIBUTION OF FAMILY FIRMS BY GENERATIONS

Generations	First	Second	Third	Fourth	Total
No of Firms	42 (39.3%)	48 (44.0%)	11 (13.1%)	3 (3.6%)	104

Correlation coefficients as well as means and standard deviations of the variables in the full sample are displayed in Table 4.10. There are several significant correlations in the table. The statistically significant correlations relevant to this study are briefly discussed below. It is shown that *innovation* ($r = 0.155$, $p < 0.05$) is positively correlated to *firm performance* in terms of return on total assets in all SMEs in the sample. Similarly, *employee training* ($r = 0.125$, $p < 0.1$), *networks* ($r = 0.116$, $p < 0.1$), *firm size* (Ln employees) ($r = 0.151$, $p < 0.05$) and *past performance* ($r = 0.566$, $p < 0.01$) are also positively correlated with firm performance in terms of return on total assets.

Correlation coefficients for the SMEs indicate that firm size is positively correlated with *return on total assets* ($r = 0.151$, $p < 0.05$), *employee training* ($r = 0.197$, $p < 0.01$), *formal planning* ($r = 0.199$, $p < 0.01$), and *comparison of performance* ($r = 0.165$, $p < 0.05$). In addition, consistent with some previous innovation research, the results show that firm size is negatively correlated with *innovation* ($r = -0.146$, $p < 0.05$). Also interestingly, *innovation* ($r = 0.235$, $p < 0.05$) and *formal planning* ($r = 0.141$, $p < 0.05$) are positively correlated with firm performance in terms of sales growth, but negatively correlated with *firm age* ($r = -0.203$, $p < 0.01$). These results suggest that for SMEs, regardless of their form of ownership, some organisational learning characteristics are positively related to innovation, and also suggest that innovation has a positive impact on firm performance.

TABLE 4-10 SUMMARY DESCRIPTIVE STATISTICS AND CORRELATION MATRIX FOR THE FULL SAMPLE (N =222)

	Mean	Std. deviation	Sales growth	ROTA	Innovation	Mgt. development	Employee training	Formal planning	Networks	Comparison of performance	Ln(emp)	Past performance
Sales growth	7.982	20.164										
ROTA	13.701	16.585	0.196***									
Innovation	4.699	9.871	0.235**	0.155**								
Mgt development	0.311	0.464	0.084	0.026	-0.005							
Employee training	0.464	0.499	-0.048	0.125*	0.015	0.449**						
Formal planning	0.419	0.494	0.141**	0.073	-0.056	0.179***	0.144**					
Networks	0.333	0.472	0.052	0.116*	-0.003	0.103	0.006	0.271***				
Comparison of performance	0.284	0.452	0.032	-0.027	-0.006	0.095	0.136**	0.3336***	0.254***			
Ln(employees)	3.426	0.891	-0.073	0.151**	-0.146**	0.070	0.197***	0.199***	0.065	0.165**		
Past performance	14.874	15.296	-0.036	0.566***	-0.262***	0.005	0.069	0.029	0.117*	0.015	0.048	
Firm age	4.023	0.915	-0.203***	-0.102	-0.077	-0.155**	-0.063	-0.071	-0.059	-0.048	0.120*	-0.036

*** indicates statistical significance at the 1% level (2-tailed), ** indicates statistical significance at the 5% level (2-tailed), and * indicates statistical significance at the 10% level (2-tailed).

4.4 RESULTS OF THE STUDY

4.4.1 LEARNING, INNOVATION AND PERFORMANCE: WITHIN FAMILY SMES

Table 4.11 presents the means, standard deviations, and correlation coefficients between the variables of interest in the study, to provide an insight to, and also a preview for, the regression analysis results reported in the subsequent section. It is shown that innovation in manufacturing family SMEs is positively correlated with firm performance in terms of sales growth ($r = 0.360$, $p < 0.01$). Similarly, regression coefficients indicate positive correlation between formal planning and sales growth ($r = 0.192$, $p < 0.1$), networks and sales growth ($r = 0.199$, $p < 0.05$), and return on total assets and sales growth ($r = 0.248$, $p < 0.05$). The results further demonstrate that networks are positively correlated with innovation ($r = 0.206$, $p < 0.05$) but firm size is negatively correlated with innovation ($r = -0.312$, $p < 0.01$).

Given that correlations between independent variables can cause problems with multicollinearity, examining the values of correlation coefficients is of added importance to the regression analysis when interpreting the results. More commonly, the issue of multicollinearity arises when there is a high degree of correlation (either positive or negative) between two or more independent variables in the model. The correlation matrix demonstrates that none of the correlation coefficients are above the level considered to be serious, which is generally accepted as $r>0.8$ (Hensher, Rose, & Greene, 2005, p.246; Licht, 1995, p.45), indicating that multicollinearity does not appear to be an issue in the regression analysis. Moreover, variance inflation factors (VIF) were also examined to assess the presence of multicollinearity. The results show that the VIF for the independent variables are below the threshold value of 10 (as a rule of thumb a VIF value of 10 or above indicates multicollinearity), indicating that no collinearity problems exist between independent variables. The maximum value of the VIF is presented with each regression result. Next, the results of hypotheses testing are discussed.

TABLE 4-11 SUMMARY DESCRIPTIVE STATISTICS AND CORRELATION MATRIX FOR THE FAMILY SMES SAMPLE (N =104)

	Mean	Std. deviation	Sales growth	ROTA	Innovation	Mgt development	Employee training	Formal planning	Network	Comparison of performance	Ln(emp)	Past performance
Sales growth	5.10	15.86										
ROTA	13.53	13.79	0.248**									
Innovation	3.56	5.20	0.360***	0.083								
Mgt development	0.26	0.44	-0.116	0.076	0.025							
Employee training	0.48	0.50	-0.008	0.103	0.083	0.484***						
Formal planning	0.38	0.49	0.192*	-0.001	0.050	0.221**	0.129					
Networks	0.35	0.48	0.199**	0.187*	0.206**	0.122	-0.053	0.271***				
Comparison of performance	0.31	0.46	0.142	-0.016	0.075	0.080	0.151	0.301***	0.128			
Ln(employees)	3.39	0.82	-0.014	0.035	-0.312***	0.085	0.142	0.118	-0.090	0.121		
Past performance	14.92	13.06	0.056	0.603***	-0.087	0.029	0.029	-0.130	0.206**	0.019	0.017	
Firm age	4.30	0.85	-0.059	-0.088	-0.069	-0.158	-0.135	-0.085	-0.138	-0.112	0.186*	-0.121

*** indicates statistical significance at the 1% level (2-tailed), ** indicates statistical significance at the 5% level (2-tailed) and * indicates statistical significance at the 10% level (2-tailed).

4.4.2 TESTING OF HYPOTHESES

4.4.2.1 ORGANISATIONAL LEARNING AND INNOVATION

Multiple linear regression analysis was conducted to test the research hypotheses concerned with the relationships between organisational leaning, innovation and firm performance in manufacturing family SMEs. Results of the analysis relating to the first five hypotheses (1a, 1b, 1c, 2 and 3) concerning organisational learning and innovation are presented in Table 4.12.

TABLE 4-12 ORGANISATIONAL LEARNING AND INNOVATION IN FAMILY SMES

Variables	Innovation
Independent variables:	
Employee training	0.107 *(1.071)*
Management development	0.029 *(0.308)*
Comparison of performance	0.091 *(0.963)*
Formal planning	0.040 *(0.410)*
Networks	0.179** *(1.921)*
Control variables:	
Firm size (Ln - employees)	-0.296*** *(-3.180)*
Firm age	0.011 *(0.120)*
Past performance	-0.124* *(-1.307)*
Intercept	9.286*** *(4.359)*
R square	0.129
F-value	7.508***
Max VIF	1.104

Note N =104, *t* values are in parentheses.
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

The results show that the coefficients of the independent variables, that is, employee training ($\beta = 0.107$, $p > 0.1$), management development ($\beta = 0.029$, $p > 0.1$), comparison of firm performance ($\beta = 0.091$, $p > 0.1$) and formal planning ($\beta = 0.040$, $p > 0.1$) are statistically insignificant in explaining the relationships established in Hypotheses 1a, 1b, 1c and 2. However, the results supported the predicted positive relationship between networks and innovation in manufacturing family SMEs ($\beta = 0.179$, $p < 0.05$), consistent with Hypothesis 3. Results further show that firm age is insignificant for innovation[11].The results of the hypotheses relating to organisational learning and innovation are presented in Table 4.13.

TABLE 4-13 HYPOTHESIS TESTING RESULTS: ORGANISATIONAL LEARNING AND INNOVATION IN FAMILY SMES

	Hypotheses	Results
H1	Commitment to learning (*H1a - employee training, H1b - management development, and H1c - comparison of performance*) is positively associated with innovation in family SMEs	**H1(a) – Unsupported** **H1(b) - Unsupported** **H1(c) - Unsupported**
H2	Shared vision (*formal planning*) is positively associated with innovation in family SMEs.	**Unsupported**
H3	Networking (*external networks*) is positively associated with innovation in family SMEs.	**Supported**

[11] Consistent with some earlier studies (Cefis & Marsili, 2005), the regression results indicate that innovation in manufacturing firms is not influenced by firm age. In addition, the results indicate a negative relationship between firm size and innovation. Analysing an innovation dataset of Finnish firms in terms of the various size characteristics of the firm, Simone and McCann (2008) also found a similar relationship, in that SMEs employing fewer than 50 employees appeared to be positively and significantly related both to the introduction of product innovations and to the introduction of new products to the market. This may be due to greater flexibility with respect to adjusting research plans or during the implementation phase of innovations. Some research has shown that small firms may also find it easier to adjust employee incentives to encourage optimal innovative effort, or permit less rigid management structures that allow key employees to devote time to innovation-related rather than management-related tasks (Rogers, 2004; Vaona & Pianta, 2008). Hence, small firms might have a greater advantage in innovation compared to medium and large firms.

4.4.2.2 ORGANISATIONAL LEARNING AND FIRM PERFORMANCE

To test Hypotheses 4 to 6 two sets of regressions were conducted separately for the dependent variable of firm performance (sales growth and return on total assets), using the independent variables of management development, employee training, comparison of performance, formal planning, and networks. Each set of regressions measures the effect of organisational learning on firm performance, controlling for innovation, firm age, size and past performance. Results are displayed in Table 4.14.

TABLE 4-14 ORGANISATIONAL LEARNING AND FIRM PERFORMANCE IN FAMILY SMES

Variables	Firm Performance	
	Sales Growth (test 1)	**ROTA (test 2)**
Independent variable:		
Employee training	0.024 *(0.233)*	0.075 *(0.953)*
Management development	0.172** *(1.8582)*	0.055 *(0.700)*
Comparison of performance	0.073 *(0.766)*	-0.038 *(-0.487)*
Formal planning	0.212** *(2.295)*	0.073 *(0.925)*
Networks	0.101 *(1.056)*	0.036 *(0.442)*
Control variables:		
Innovation	0.354*** *(3.923)*	0.136** *(1.730)*
Firm size (Ln - employees)	0.098 *(1.023)*	0.074 *(0.902)*
Firm age	-0.045 *(-0.491)*	-0.004 *(-0.055)*
Past performance	0.123* *(1.348)*	0.615*** *(7.824)*
Intercept	0.273 *(0.129)*	2.561* *(1.391)*
R square	0.188	0.382
F-value	7.728***	31.169***
Max VIF	1.136	1.108

Note N =104, *t* values are in parentheses.
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

Hypothesis 4b, which proposed that management development is positively linked with performance in family SMEs, was supported ($\beta = 0.172$, $p < 0.05$) as shown in Test 1 in Table 4.14. Formal planning shows a significant positive link ($\beta = 0.212$, $p < 0.05$) with firm performance, supporting Hypothesis 5. However, there is no statistical evidence to support Hypothesis 4a regarding an association of employee training with firm performance ($\beta = 0.024$, $p > 0.1$), 4c regarding an association of comparison of performance with firm performance ($\beta = 0.073$, $p > 0.1$) and 6 regarding an association of networks with firm performance ($\beta = 0.101$, $p > 0.294$). The results of Test 2 in Table 4.14 show that none of the organisational learning variables are significantly linked with firm performance in terms of return on total assets.

The effect of the control variable innovation on firm performance (sales growth) is strongly significant ($\beta = 0.354$, $p < 0.01$) in Test 1. In Test 2 the same relationship in terms of return on total assets is significant at 95% confidence level ($\beta = 0.136$, $p < 0.05$). Both regressions show a positive link between innovation and firm performance. The results of hypotheses relating to organisational learning and firm performance are presented in Table 4.15.

TABLE 4-15 HYPOTHESIS TESTING RESULTS: ORGANISATIONAL LEARNING AND FIRM PERFORMANCE IN FAMILY SMES

	Hypotheses	Results
H4	Commitment to learning (*H4a - employee training, H4b - management development, and H4c - comparison of performance)* is positively associated with performance in family SMEs.	**H4(a) - Unsupported** **H4(b) - Supported** **H4(c) - Unsupported**
H5	Shared vision (*formal planning*) is positively associated with performance in family SMEs.	**Supported**
H6	Networking (*external networks)* is positively associated with performance in family SMEs.	**Unsupported**

4.4.2.3 INNOVATION AND FIRM PERFORMANCE

Hypothesis 7 was developed to test the relationship between innovation and firm performance in manufacturing family SMEs.

TABLE 4-16 INNOVATION AND FIRM PERFORMANCE IN FAMILY SMES

Variables	Firm Performance	
	Sales Growth	ROTA
Independent variable:		
Innovation	0.334*** *(3.550)*	0.136** *(1.730)*
Control variables:		
Employee training	-0.029 *(-0.312)*	0.075 *(0.953)*
Management development	0.142* *(1.547)*	0.055 *(0.700)*
Comparison of performance	0.103 *(1.108)*	-0.038 *(-0.487)*
Formal planning	0.151* *(1.594)*	0.073 *(0.925)*
Networks	0.130* *(1.386)*	0.036 *(0.442)*
Firm size (Ln - employees)	0.113 *(1.171)*	0.074 *(0.902)*
Firm age	-0.019 *(-0.201)*	-0.004 *(-0.055)*
Past performance	0.062 *(0.651)*	0.615*** *(7.824)*
Intercept	-0.012 *(-0.006)*	2.561* *(1.391)*
R square	0.146	0.382
F-value	8.639***	31.169***
Max VIF	1.109	1.108

Note *N =104, t values are in parentheses.*
*** *Significant at the 99% confidence interval* (one-tailed)
** *Significant at the 95% confidence interval* (one-tailed)
* *Significant at the 90% confidence interval* (one-tailed)

After controlling for an organisational learning effect, regression results (see Table 4.16) indicate that innovation ($\beta = 0.334$, $p < 0.01$) was positively correlated with firm

performance (sales growth). Moreover, return on total assets was used as a performance measure to test the same Hypothesis (7), and thus the results confirm the positive correlation between innovation ($\beta = 0.136$, $p < 0.05$) and firm performance, supporting research Hypothesis 7. However, the significance of the relationship between innovation and firm performance in terms of sales growth is stronger than the relationship between innovation and firm performance in terms of ROTA.

Although previous research findings have been inconsistent (Freel, 2000), the present research statistically supports the view that innovation is positively linked with firm performance, as found by Roper (1997), Calantone et al. (2002), Freel and Robson (2004) and Thornhill (2006). The results of the hypothesis relating to innovation and firm performance are presented in Table 4.17.

TABLE 4-17 HYPOTHESIS TESTING RESULTS: INNOVATION AND FIRM PERFORMANCE IN FAMILY SMES

	Hypothesis	Result
H7	Innovation is positively associated with performance in family SMEs.	**Supported**

4.4.2.4 INDIRECT EFFECTS OF INNOVATION

Hypothesis 8 was postulated to test the indirect (intervening) effects of innovation between organisational learning and firm performance. As mentioned in Chapter Three, the procedure outlined by Baron and Kenney (1986) and Frazier et al. (2004) was used. In Step 1, the regression results reported that employee training ($\beta = 0.003$, $p > 0.1$) and comparison of performance ($\beta = 0.119$, $p > 01$) were insignificant. In Step 2, the results showed that management development ($\beta = 0.029$, $p > 0.1$) and formal planning ($\beta = 0.040$, $p > 0.1$) variables were also insignificant (see Appendix D). Thus those

insignificant variables in Steps I and 2 were excluded in testing as they did not meet the preconditions necessary for the intervening effect. Therefore, the analyses were conducted for networking only. The results of the regression analysis are displayed in Table 4.18.

TABLE 4-18 INTERVENING EFFECTS OF INNOVATION BETWEEN ORGANISATIONAL LEARNING AND PERFORMANCE IN FAMILY SMES

Testing steps	B	SE B	β	*t*-value	Sobel Z
Step 1 - Organisational learning and firm performance (without controlling for innovation)					
DV **:** Firm performance (Sales Growth)					
IV **:** Networks	6.598	3.220	0.199**	2.049	
Step 2 - Organisational learning and innovation					
DV **:** Innovation					
IV **:** Networks	1.947 (a)	1.014	0.179**	1.921	
Step 3 - Innovation and firm performance					
DV **:** Firm performance (Sales growth)					
IV **:** Innovation	1.017 (b)	0.287	0.334***	3.550	
Step 4 - Organisational learning and firm performance (controlling for innovation)					
DV **:** Firm performance (Sales growth)					
IV **:** Networks	4.322	3.117	0.101	1.056	1.689

Note : N =104, B -= unstandardised beta; B (SE) = standard error of beta; β = standardised beta, DV= dependent variable IV = independent variable
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

The unstandardised regression coefficients of network in Step 1 ($B = 6.598$, $p < 0.05$), Step 2 ($B = 1.947$, $p < 0.05$), and the unstandardised coefficient of innovation after controlling for organisational learning ($B = 1.017$, $p < 0.01$) in Step 3 were significant, and thus the conditions for the presence of an intervening effect were met. In Step 4, the degree of intervene (whether full or partial) was tested by regressing network and firm performance, controlling for innovation. The results show that networks ($B = 4.322$, $p >$

0.1) is insignificant when innovation is controlled, indicating a fully intervened relationship of innovation, and supporting Hypothesis 8. The results of the Sobel test[12] (Z = 1.689, one-tailed test) indicate a significant intervening effect. These results show that the effect of networks on firm performance is fully explained by organisational innovation. A summary of the results is presented in Table 4.19.

TABLE 4-19 HYPOTHESIS TESTING RESULTS: INTERVENING EFFECTS OF INNOVATION BETWEEN ORGANISATIONAL LEARNING AND PERFORMANCE IN FAMILY SMES

	Hypothesis	Result
H8	The relationship between organisational learning (networking) and performance in family SMEs is positively intervened by firm innovation.	**Supported**

4.4.3 LEARNING, INNOVATION AND PERFORMANCE BETWEEN FAMILY AND NON-FAMILY SMES

This section of the analysis seeks to establish whether organisational learning practices in family and non-family manufacturing SMEs affect innovation and firm performance differentially and also to ascertain whether innovation affects firm performance differentially. However, before performing the regression analysis, an independent *t* test was conducted to test whether the differences of means for variables in the study between family and non-family manufacturing SMEs were statistically significant. Table 4.20 presents the *t* test results.

[12] The Sobel test was used to test the significance of intervening effect. Thus, the Sobel Z score was obtained using $Z = ab \Big/ \sqrt{a^2sb^2 + b^2sa^2}$ formula, where "a" is the unstandardised regression coefficient of networks (Step 2), "b" is the unstandardised regression coefficient of innovation (Step 3), "sa" is the standard error of beta (networks - Step 2) and "sb" is the standard errors of beta (innovation – Step 3).

The results indicate that there were no significant differences in the means of variables at 99%, 95% or 90% confidence levels except for the firm age, indicating fitness of the variables for comparison analysis. The difference in the means of the firm age was not considered a serious issue to the results of the study, as it served as a variable for controlling the effects between independent, intervening and dependent variables. Additionally, Table 4.21 presents the means, standard deviations and correlation matrix for the non-family manufacturing SMEs sample. The next section of the study compares the effects of organisational learning on innovation and firm performance, and the effect of innovation on firm performance between family and non-family firms.

TABLE 4-20 DIFFERENCES OF MEANS TESTS

	Family	**Non family**	***t*-statistics**
Number of firms	104	118	
Sales growth	5.102	10.520	1.858
ROTA	13.527	13.854	0.149
Innovation	3.555	5.708	1.628
Management development	0.259	0.356	1.557
Employee training	0.481	0.449	0.469
Formal planning	0.375	0.458	1.246
Networks	0.346	0.322	0.379
Comparison of performance	0.308	0.263	0.739
Ln(employees)	3.391	3.456	0.543
Past performance	14.920	14.834	0.042
Firm age	4.384	3.780	4.387**

** Significant at 95% confidence level.

TABLE 4-21 SUMMARY DESCRIPTIVE STATISTICS AND CORRELATION MATRIX FOR THE NON-FAMILY SMES SAMPLE (N =118)

	Mean	Std. deviation	Sales growth	ROTA	Innovation	Mgt development	Employee training	Formal planning	Networks	Comparison of performance	Ln(emp)	Past performance
Sales Growth	10.52	23.08										
ROTA	13.85	18.76	0.174*									
Innovation	5.82	12.69	0.185**	-0.224**								
Mgt development	0.36	0.48	0.175*	-0.004	-0.040							
Employee training	0.45	0.50	-0.067	0.142	-0.006	0.432***						
Formal planning	0.46	0.50	0.099	0.120	0.199	0.134	0.162*					
Networks	0.32	0.47	-0.030	0.071	0.073*	0.094	0.034	0.277***				
Comparison of performance	0.26	0.44	-0.025	-0.034	-0.035	0.119	0.199	0.399***	0.372***			
Ln(employees)	3.46	0.96	-0.112	0.225**	-0.103	0.055	0.242***	0.255***	0.187**	0.205**		
Past performance	14.83	17.08	-0.079	0.547***	-0.320***	-0.009	0.098	0.135	0.058	0.013	0.065	
Firm age	3.78	0.91	-0.241***	-0.114	-0.046	-0.113	-0.025	-0.021	-0.013	-0.025	0.102	0.013

*** indicates statistical significance at the 1% level (2-tailed) ** indicates statistical significance at the 5% level (2-tailed) and * indicates statistical significance at the 10% level (2-tailed).

4.4.3.1 ORGANISATIONAL LEARNING AND INNOVATION

To test Hypotheses 9 to 11 regression analysis was conducted controlling for firm size, age and past performance.

TABLE 4-22 ORGANISATIONAL LEARNING AND INNOVATION BETWEEN FAMILY AND NON-FAMILY SMES

Variables	Family	Non-Family
Independent variables:		
Employee training	0.107 *(1.071)*	0.029 *(0.331)*
Management development	0.029 *(0.308)*	-0.035 *(-0.396)*
Comparison of performance	0.091 *(0.963)*	-0.025 *(-0.285)*
Formal planning	0.040 *(0.410)*	0.070 *(0.792)*
Networks	0.179** *(1.921)*	0.150* *(1.363)*
Control variables:		
Firm size (Ln - employees)	-0.296*** *(-3.180)*	-0.089 *(-1.013)*
Firm age	0.011 *(0.120)*	-0.041 *(-0.467)*
Past performance	-0.124* *(-1.307)*	-0.324*** *(-3.687)*
Intercept	9.286*** *(4.359)*	9.243*** *(6.335)*
R square	0.129	0.105
F-value	7.508***	13.591***
Max VIF	1.104	1.018

Note N =222 (Family = 104, Non-family = 108), *t* values are in parentheses.
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

The test results (see Table 4.22) show that the relationship of organisational learning variables (except networks) with innovation in family and non- family firms was insignificant, viz employee training (family: $\beta = 0.107$, $p > 0.1$ non-family: $\beta = 0.029$, p

>0.1), management development (family: β = 0.029, p >0.1 non-family: β = -0.035, p >0.1), comparison of firm performance (family: β = 0.091, p >0.1 non-family: β = -0.025, p >0.1), and formal planning (family: β = 0.040, p >0.1 non-family: β = 0.070 p >0.1). The relationship between networks and innovation is significant in family firms at the 95% confidence level (β = 0.179, p <0.05). In the case of non-family firms the same relationship is significant at the 90% confidence level (β = 0.150, p <0.1). The comparison was therefore performed for networking only.

To determine the significance of differences across the two groups in the effects of the networks on innovation the Chow test was conducted. The Chow test results indicate that there is a significant difference between family and non-family firms in the effect of networks on innovation at the 95% confidence level $F_{(5\%,2,218)} = 3.037 < F = 3.884$). Thus Hypothesis 11 is supported. The results of the hypotheses relating to organisational learning and innovation in family and non-family SMEs are presented in Table 4.23.

TABLE 4-23 HYPOTHESIS TESTING RESULTS: ORGANISATIONAL LEARNING AND INNOVATION: BETWEEN FAMILY AND NON-FAMILY SMES

	Hypotheses	Results
H9	The relationship between commitment to learning (*H9a - employee training, H9b - management development, and H9c - comparison of performance)* and innovation is stronger in family SMEs than in non-family SMEs.	**H9(a) - Not compared because of insignificant relationship** **H9(b) - Not compared because of insignificant relationship** **H9(c) - Not compared because of insignificant relationship**
H10	The relationship between shared vision *(formal planning*) and innovation is stronger in family SMEs than in non-family SMEs	**Not compared because of insignificant relationship**
H11	The relationship between networking (*external networks)* and innovation is stronger in family SMEs than in non-family SMEs.	**Supported**

4.4.3.2 ORGANISATIONAL LEARNING AND FIRM PERFORMANCE

The results in Table 4.24 indicate an unequal degree of influence of employee training (family: $\beta = 0.024$, $p > 0.1$, non-family: $\beta = 0.172$, $p < 0.05$), management development (family: $\beta = 0.172$, $p < 0.05$, non-family: $\beta = 0.232$, $p < 0.01$), and formal planning (family: $\beta = 0.212$, $p < 0.05$, non-family: $\beta = 0.118$, $p < 0.1$) on firm performance between family and non-family firms. The Chow test results[13] relating to these can be summarised as follows.

The effect of employee training on firm performance was stronger in non-family firms than in family firms at the 95% confidence level ($F_{(5\%,2,218)} = 3.037 < F = 3.589$), indicating insufficient evidence to support Hypothesis 12a. The use of management development was stronger in non-family firms than in family firms at the 95% confidence level ($F_{(5\%,2,218)} = 3.037 < F = 5.76$). Thus Hypothesis 12b is also unsupported. The relationship between formal planning and firm performance ($F_{(5\%,2,218)} = 3.037 < F = 3.589$) is significantly stronger for family firms than for non-family firms at the 95% confidence level and thus Hypothesis 13 is supported.

The regression results are insignificant for comparison of firm performance (family: $\beta = 0.073$, $p > 0.1$, non-family: $\beta = -0.032$, $p > 0.1$) and networks (family: $\beta = 0.101$, $p > 0.1$, non-family: $\beta = -0.036$, $p > 0.1$), indicating no influence on the predictor variable. The comparison was therefore not performed for Hypotheses 12c and 14. The regression test results are shown in Table 4.24.

[13] The Chow test results are presented in Appendix E.

TABLE 4-24 ORGANISATIONAL LEARNING AND PERFORMANCE BETWEEN FAMILY AND NON-FAMILY SMES

Variables	Firm Performance			
	Sales growth		ROTA	
	Family	Non-Family	Family	Non-Family
Independent variables:				
Employee training	0.024 *(0.233)*	0.172** *(1.782)*	0.075 *(0.953)*	0.042 *(0.531)*
Management development	0.172** *(1.858)*	0.232*** *(2.385)*	0.055 *(0.700)*	-0.026 *(-0.339)*
Comparison of performance	0.073 *(0.766)*	-0.032 *(-0.367)*	-0.038 *(-0.487)*	-0.088 *(-1.138)*
Formal planning	0.212** *(2.295)*	0.118* *(1.325)*	0.073 *(0.925)*	-0.005 *(-0.062)*
Networks	0.101 *(1.056)*	-0.036 *(-0.411)*	0.036 *(0.442)*	0.002 *(0.029)*
Control variables:				
Innovation	0.354*** *(3.923)*	0.193** *(2.207)*	0.136** *(1.730)*	-0.430 *(-0.535)*
Firm size (Ln - employees)	0.098 *(1.023)*	-0.044 *(-0.484)*	0.740 *(0.902)*	0.194*** *(2.557)*
Firm age	- 0.045 *(-0.491)*	-0.210*** *(-2.398)*	-0.004 *(-0.055)*	-0.140** *(-1.853)*
Past performance	0.123* *(1.348)*	0.006 *(0.068)*	0.615*** *(7.824)*	0.537*** *(7.099)*
Intercept	0.273 *(0.120)*	28.304*** *(3.100)*	2.561* *(1.391)*	2.906 *(0.381)*
R square	0.188	0.141	0.382	0.351
F-value	7.728***	4.619***	31.169***	20.595***
Max VIF	1.136	1.247	1.108	1.128

Note N =222 (Family = 104, Non-family = 108), *t* values are in parentheses.
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

The results of the hypotheses relating to organisational learning and firm performance of family and non-family SMEs are presented in Table 4.25.

TABLE 4-25 HYPOTHESIS TESTING RESULTS: ORGANISATIONAL LEARNING AND FIRM PERFORMANCE: BETWEEN FAMILY AND NON-FAMILY SMES

	Hypotheses	Results
H12	The relationship between commitment to learning (*H12a - employee training, H12b - management development, and H12c - comparison of performance*) and performance is stronger in family SMEs than in non-family SMEs.	**H12(a) - Unsupported** **H12(b) - Unsupported** **H12(c) - Not compared because of insignificant relationship**
H13	The relationship between shared vision (*formal planning*) and firm performance is stronger in family SMEs than in non-family SMEs	**Supported**
H14	The relationship between networking (*external networks)* and firm performance is stronger in family SMEs than in non-family SMEs.	**Not compared because of insignificant relationship**

4.4.3.3 INNOVATION AND FIRM PERFORMANCE

Hypothesis 15 was postulated to test the impact of innovation on firm performance in manufacturing family and non-family SMEs. The regression results (see Table 4.26) indicate the significance of the impact of innovation (family: $\beta = 0.334$, $p < 0.01$, non-family: $\beta = 0.193$, $p < 0.05$) on firm performance in terms of sales growth in both groups of firms. The Chow test results[14] show a stronger positive effect of innovation on firm performance in family firms than in non-family firms at the 95% confidence level ($F_{(5\%,2,218)} = 3.037 < F = 4.123$, indicating sufficient evidence to support Hypothesis 15. However, the Chow test results indicate a marginally (90% confidence level) stronger

[14] The Chow test results are presented in Appendix E

positive impact of innovation on firm performance in terms of return on total assets in family firms ($F_{(10\%,2,218)}$ = 1.621< F = 2.214) than in non-family firms.

TABLE 4-26 INNOVATION AND FIRM PERFORMANCE: BETWEEN FAMILY AND NON-FAMILY SMES

Variables	Firm Performance			
	Sales Growth		ROTA	
	Family	Non-family	Family	Non-family
Independent variable:				
Innovation	0.334*** *(3.550)*	0.193** *(2.207)*	0.136** *(1.730)*	-0.043 *(-0.535)*
Control variables:				
Employee training	-0.029 *(-0.312)*	0.172** *(1.782)*	0.075 *(0.953)*	0.044 *(0.588)*
Management development	0.142* *(1.547)*	0.232*** *(2.385)*	0.055 *(0.700)*	-0.027 *(-0.358)*
Comparison of performance	0.103 *(1.108)*	-0.032 *(-0.367)*	-0.038 *(-0.487)*	-0.088 *(-1.140)*
Formal planning	0.151* *(1.1594)*	0.118* *(1.325)*	0.073 *(0.925*	-0.007 *(-0.091)*
Networks	0.130* *(1.550)*	-0.036 *(-0.411)*	0.036 *(0.442)*	0.001 *(0.009)*
Firm size (Ln - employees)	0.113* *(1.171)*	-0.044 *(-0.484)*	0.074 *(0.902)*	0.191*** *(2.491)*
Firm age	-0.019 *(-0.201)*	-0.210*** *(-2.389)*	-0.004 *(-0.055)*	-0.142** *(-1.864)*
Past performance	0.062 *(0.651)*	0.006 *(0.068)*	0.615*** *(7.824)*	0.523*** *(6.535)*
Intercept	-0.012 *(-0.006)*	28.304*** *(9.131)*	2.561* *(1.391)*	3.857 *(0.491)*
R square	0.129	0.110	0.369	0.315
F-value	8.639***	4.619***	31.169***	15.421***
Max VIF	1.109	1.230	1.108	1.088

Note N =222 (Family = 104, Non-family = 108), *t* values are in parentheses.
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

The results for the hypotheses relating to innovation and firm performance of family and non-family SMEs are presented in Table 4.27.

TABLE 4-27 HYPOTHESIS TESTING RESULTS: INNOVATION AND FIRM PERFORMANCE: BETWEEN FAMILY AND NON-FAMILY SMES

	Hypotheses	Results
H15	The relationship between innovation and performance is stronger in family SMEs than in non-family SMEs.	**Supported**

4.5 CHAPTER SUMMARY

The chapter reported the data analysis and results. The chapter commenced with a descriptive analysis to provide a general understanding of the data contained in the BLS over the financial years 1995/96 to 1997/98. Then the chapter presented the descriptive statistics pertaining to sample selection and the variables used in the study. Linear regression models were adopted to test the hypotheses. The intervening effect of innovation between organisational learning and firm performance was tested using the procedure outlined by Baron and Kenny (1986) and Frazier et al., (2004). The Sobel test was used to measure the significance of the intervening effect. When comparing the effect of innovation and firm performance in the light of organisational learning and innovation between family and non-family SMEs, the Chow test was used. It was reported that although some hypotheses are supported as predicted, others were not.

CHAPTER FIVE

5. DISCUSSION

5.1 INTRODUCTION

This chapter consists of seven sections including this introduction. In Section 2 an overview of the research is provided. In Section 3 a brief summary of "within" family SMEs results is presented. Section 4 discusses these results. Section 5 presents "between" family and non-family SMEs results. These are discussed in Section 6. Finally, in Section 7 the chapter summary is presented.

5.2 OVERVIEW OF RESEARCH

The contemporary business environment has become more and more competitive as a result of a number of inexorable developments in technology, information and the global marketplace. Several studies (e.g. Armstrong & Foley, 2003; Baldwin, Danielson, & Wiggenhorn, 1997; De Geus, 1988; Nonaka, 1991; Senge, 1990; Wang, 2008) have highlighted that firms promoting learning perform better in this environment because of the enhanced knowledge and skills of their employees. Academics and practitioners have argued that knowledge and skills and the capabilities they develop are strategic resources, and that the effective utilisation of these resources becomes a major source of competitive advantage (De Geus, 1988; Garvin, 1993; Goh & Richards, 1997; Grant, 1996a, 1996b; Senge, 1990; Slater & Narver, 1995; Stata, 1989).

While organisational learning promotes the development of these knowledge and skills-based resources (Baldwin et al., 1997; Lei, Hitt, & Bettis, 1996; Senge, 1996), studies further posit that such resources facilitate innovation (Baker & Sinkula, 1999; Calantone

et al., 2002; Chirico, 2008; Huber, 1998; Hurley & Hult, 1998), thereby increasing firm performance (Baker & Sinkula, 1999; Calantone et al., 2002; Craig & Dibrell, 2006; Damanpour & Evan, 1984; Rothwell, 1992). Given its strategic significance for innovation and firm performance, organisational learning is currently the focus of considerable attention among both scholars and practitioners, and it is addressed by a broad range of literature.

This study used the context of family SMEs to explore the impact of organisational learning on innovation and firm performance, mainly for the reasons that family businesses: (1) are the prevalent form of business in most economies (Daily & Dollinger, 1993; Moores & Mula, 2000; Morck & Yeung, 2004a) (2) contribute significantly to economic well-being and development (Carlson et al., 2006; Gomez-Mejia et al., 2007; Neubauer & Lank, 1998; Zahra et al., 2004) (3) arguably have a priori features (e.g. long tenure CEOs (Le Breton-Miller & Miller, 2006; Moores, 2009; Tsai et al., 2006), higher of levels of trust and interaction (Jones, 1983; Miller et al., 2008) between management and employees, flexible structures (Birdthistle, 2005) and unique social systems (Zahra et al., 2008; Zahra et al., 2007)) which suggest they might encourage greater learning than non-family firms, and (4) particularly family SMEs, have not been the subject of previous research exploring the strategic impact of organisational learning on innovation and performance.

This study has argued that organisational learning affects firm performance not only in a direct manner but also in an indirect manner via innovation. Accordingly, a conceptual framework for the research was developed using three constructs: organisational learning, innovation and firm performance. The organisational learning construct was operationalised using three dimensions: *commitment to learning, shared vision, and*

networking. To measure *commitment to learning*, three separate variables, employee training, management development, and comparison of performance were used. *Shared vision* was measured using the presence of formal planning in the firms. *Networking* was measured using the existence of external networks. The *innovation* construct was measured using product and process innovation intensity, and *firm performance* was measured in terms of growth of sales and rate of return on total assets.

Data for the study were drawn from the Business Longitudinal Survey conducted by the Australian Bureau of Statistics over the financial years 1995/96 – 1997/98, which provided the most recently available comprehensive longitudinal dataset that consisted of a wide representation of SMEs in Australia. Using criteria outlined in Chapter Three, a sample of 222 manufacturing SMEs comprised of 104 family and 118 non-family SMEs was selected for the research.

The manufacturing industry was chosen for several reasons. Manufacturing SMEs are the major segment of business in the Australian economy. Over the last few decades, the performance of Australian manufacturing SMEs has been a major preoccupation of policy-makers and the federal government (ACCI, 2007; McMahon, 2001b). Moreover, this sector is continually challenged by the volatile economy, growing global competition and changing market conditions (Prime Minister's Science, Engineering and Innovation Council, 2007). These factors make the manufacturing industry an appropriate setting to study the research questions posed in this thesis.

The study analysed data in two ways: within family SMEs and between family and non-family SMEs. First, within family SMEs we analysed the direct and indirect effects of organisational learning on innovation and firm performance. Second, we analysed the

effects of organisational learning, innovation and firm performance between family and non-family SMEs (see Section 5.5).

5.3 WITHIN FAMILY ANALYSIS AND TEST RESULTS

To analyse the direct effects of organisational learning on innovation and performance within family SMEs, three regression tests were conducted. The first test assessed the effect of organisational learning on innovation. The second test assessed the effect of organisational learning on firm performance. The third test assessed the effect of innovation on firm performance. The indirect effects of organisational learning on firm performance were tested using the linear regression analysis procedure proposed by Baron and Kenny (1986) and Frazier et al. (2004), using product and process innovation as an intervening variable.

Furthermore, we used the lag effect in building the causal relationships (Granger, 1969), between learning, innovation and firm performance. Accordingly, learning data in 1995/96 (Y_{-2}), innovation data in 1996/97 (Y_{-1}) and firm performance data in 1997/98 (Y_0) were used for the analyses. The variables used for these analyses are presented in Table 5.1.

TABLE 5-1 VARIABLES USED FOR REGRESSION ANALYSIS

Relationships	Constructs/Dimensions	Variables used
Organisational learning and innovation	Commitment to learning	Employee training Management development Comparison of performance
	Shared vision	Formal planning
	Networking	Networks
	Innovation	Product & process innovation
Organisational learning and firm performance	Commitment to learning	Employee training Management development Comparison of performance
	Shared vision	Formal planning
	Networking	Networks
	Firm performance	Growth of sales Return on assets
Innovation and firm performance	Innovation	Product & process innovation
	Firm performance	Growth of sales Return on assets

The results of the hypothesis tests concerning research questions 1, 2 and 3 that explored learning, innovation and performance within family SMEs are summarised in Table 5.2.

TABLE 5-2 HYPOTHESIS TESTING RESULTS

Hypotheses		Results
Research Question 1: Does organisational learning in family SMEs affect firm innovation?		
H1	Commitment to learning (*H1a - employee training, H1b - management development, and H1c - comparison of performance*) is positively associated with innovation in family SMEs.	H1(a) - Unsupported H1(b) - Unsupported H1(c) - Unsupported
H2	Shared vision (*formal planning*) is positively associated with innovation in family SMEs.	Unsupported
H3	Networking (*external networks*) is positively associated with innovation in family SMEs.	Supported

Research Question 2: Does organisational learning in family SMEs affect firm performance?		
H4	Commitment to learning (*H4a - employee training, H4b - management development, and H4c - comparison of performance*) is positively associated with performance in family SMEs.	H4(a) - Unsupported H4(b) - Supported H4(c) - Unsupported
H5	Shared vision (*formal planning*) is positively associated with performance in family SMEs.	Supported
H6	Networking (*external networks*) is positively associated with performance in family SMEs.	Unsupported
Research Question 3: (a) Does innovation in family SMEs affect firm performance? and, (b) Is the relationship between organisational learning and firm performance intervened by innovation?		
H7	Innovation is positively associated with performance in family SMEs.	Supported
H8	Innovation intervenes in the relationship between organisational learning (networking) and performance in family SMEs.	Supported

5.4 DISCUSSION OF "WITHIN" RESULTS

5.4.1 ORGANISATIONAL LEARNING AND INNOVATION

To address Research Question 1, concerning the relationships between *organisational learning* and *firm innovation,* the first regression analysis was conducted. The results supported Hypothesis 3 but did not support Hypotheses 1a, 1b, 1c and 2.

As predicted, Hypothesis 3 regarding the link between *networking* (networks) and *innovation* was found to be significant ($p<0.05$), suggesting that Australian manufacturing family SMEs enhance their innovation through learning from networks. A similar conclusion was reached by Rogers (2004) using Australian survey data when he found that small manufacturing firms were better than non-manufacturing firms at

capturing the benefits of networking for innovation. Moreover, our finding is consistent with the works of Calantone et al. (2002), Ritter and Gemunden (2003), and Pittaway et al. (2004).

Learning through networks is largely influenced by trust (Powell, 1990) which is built through enduring relationships. Studies (Nahapiet & Ghoshal, 1998; Wu, Wang, Chen, & Pan, 2008) posit that trust enhances the likelihood of sharing knowledge between the members, believing that an exchange now will lead to later reciprocation (Coleman, 1990, as cited in Abrams, Cross, Lesser, & Levin, 2003; Collins & Smith, 2006; Inkpen, 1996). Moreover, in recent years, scholars (Chirico, 2008; Sundaramurthy, 2008) asserted that greater levels of trust build greater levels of openness providing ample opportunities especially for tacit knowledge to be shared and transferred over time. With respect to family firms, the literature (Alpay et al., 2008; Bopaiah, 1998; Gomez-Mejia et al., 2001; Miller & Le Breton-Miller, 2005; Palmer & Barber, 2001) highlights the ability of family firms to build trust through enduring relationships with networks for broadening the scope for developing knowledge (Miller et al., 2008). In the context of learning, our results provide empirical evidence to support the notion that knowledge sharing and accumulation through networks of relationship enhance innovation of manufacturing family SMEs, thereby sustaining a firm's competitive edge (Grant, 1996b; Kogut & Zander, 1992).

Regression results of H_{1a}, H_{1b}, H_{1c} and H_2 failed to detect significant relationships between *commitment to learning, shared vision* and *innovation*. Two possible explanations for these results could be explored. The first concerns systems for utilising and integrating knowledge (Chirico & Salvato, 2008; Grant, 1996a; Kraaijenbrink & Wijnhoven, 2008; Nevis et al., 1995; Senge, 1990) and the second relates to the

availability of resources (Festing, 2007; Sambrook & Stewart, 2000; Tiwari & Buse, 2007; Tung & Aycan, 2008; Wickramansinghe & Sharma, 2005) to leverage learning. That is, any knowledge accumulated and shared from learning will depend upon knowledge integration and utilisation systems (KIUS) and/or the availability of adequate resources in order to produce innovative outcomes.

To access and use knowledge, organisations need to develop effective KIUS (Chirico & Salvato, 2008; Grant 1996a; Kraaijenbrink & Wijnhoven, 2008; Navis et al., 1995; Senge, 1990). This means that KIUS provide a platform for an organisation to access and use individual knowledge for organisational development. However, the lack of such systems will reduce the perceived benefits of learning, thereby preventing organisational development. Some studies (e.g. Kotaro, 1998; Sambrook & Stewart, 2000) have also stressed the importance of the availability of resources for leveraging of knowledge and skills for organisational development. Concerning development of SMEs, studies (Festing, 2007; Tiwari & Buse, 2007; Tung & Aycan, 2008; Wickramansinghe & Sharma, 2005) posit that constraints on resource availability in SMEs hinder their capacity to invent and successfully commercialise new products, services or processes. Thus, lack of effective KIUS and/or resource availability could be the possible explanations for the non-significant results in our research.

Given these possible explanations, this research sought to further explore them in the light of data available within the BLS dataset. While no reasonable proxies to measure the presence of KIUS were available, however the resource availability explanation was explored using equity capital (Cooper, Gimeno-Gascon, & Woo, 1994; Russo & Fouts, 1997) as a proxy for availability of resources. Accordingly, we tested whether resource availability moderates the relationship between organisational learning and innovation

in family SMEs. Regression results did not support the moderating effect explanation (see Appendix F – Table F.1). Thus, it can be suggested that the lack of KIUS could be the more likely reason for the lack of support for H1a, H1b, H1c and H2. However, further research is needed to explore this possibility.

Our results confirm that learning is central to organisational innovation. We found that networks in particular were pivotal to the generation of this learning. That is because networks facilitate sharing and the accumulation of knowledge; they foster firm innovation. In knowledge sharing, trust built through enduring relationships plays a crucial role. Given that, our research found that family SMEs learn through networks that boost their innovative capability. These results also add weight to the argument that family firms establish trust-based relationships within these networks.

5.4.2 ORGANISATIONAL LEARNING AND FIRM PERFORMANCE

To address Research Question 2, concerning the relationships between *organisational learning* and *firm performance,* the second regression analysis was conducted. The results supported Hypotheses H4b (management development and growth of sales) and H5 (formal planning and growth of sales) but did not support Hypotheses H4a (employee training and growth of sales), H4c (comparison of past performance and growth of sales), and H6 (networks and growth of sales).

The finding of a link between management development and lagged firm performance (H4b) in this research is consistent with prior research in strategic human resources management (King-Kauanui, Ngoc, & Ashley-Cotleur, 2006; Singh, 2004; Winterton & Winterton, 1997). The organisational learning literature highlights that management has substantive roles to play in affecting learning in organisations (Senge, 1990) and it

helps to nurture an organisation's learning culture. These cultures then eventually facilitate organisational adaptation and development (Dunphy, Turner, & Crawford, 1997; Mullen & Lyles, 1993). The learning culture further influences the firm's position and disposition in structuring new processes and in decision situations (Mullen & Lyles, 1993). Such developments ultimately lead to better performance. In this context, our finding provides empirical evidence that knowledge accumulated and shared through management development in Australian manufacturing family SMEs is linked with enhanced performance.

Similarly, the finding of a link between *shared vision* (formal planning) and firm performance (H5) is also consistent with prior research (Glaister, Dincer, Tatoglu, Demirbag, & Zaim, 2008; Miller & Cardinal, 1994; Shrader, Mulford, & Blackburn, 1989). This finding suggests that the enhanced performance of Australian manufacturing family SMEs is also linked with their shared vision.

Shared vision is characterised by a sense of commonality and coherence (Teece, Rumelt, Dosi, & Winter, 1994). In family firms a sense of commonality is enhanced through the involvement of family members in firm ownership and management (Chua et al., 1999; Habbershon & Williams, 1999; Tagiuri & Davis, 1996) because family members have been raised and nurtured through a similar culture and experience. It is inevitable that this can affect firm values, beliefs and goals that are the inputs for long-term formal business planning and firm sustainability. Moreover, a sense of commonality in family firms facilitates an efficient and effective information exchange, thereby enabling firms to increase their performance through planning.

Concerning coherence, familial ties is a distinctive resource in family firms that has long been associated with greater cohesiveness (Ensley, Pearson, & Sardeshmukh, 2007; Habbershon & Williams, 1999). Such coherence can help family firms to pool their knowledge and action for consensual decision-making and effective strategy coordination and implementation and have the potential to yield better performance (Silva, Majluf, & Paredes, 2006). Moreover, research highlights that coherence in family firms purposefully guides every individual toward a common goal (Ensley & Pearson, 2005) and thereby family firms have a greater potential to generate better performance through formal planning.

However, concerning organisational learning and firm performance, Wang (2008) highlighted that firms' commitment to learning and receptiveness to new information are fundamental to the intensity of learning, but learning is conducive to influencing firm performance only when the efforts are channelled effectively towards organisational objectives. That is, although an organisational culture that supports learning may be a necessary condition for organisational success, it is by no means a sufficient condition. In this sense, what is important for a better performance via learning is the integration and effective utilisation of employees' knowledge and skills (Chirico & Salvato, 2008), in addition to the amount of knowledge and skills that is acquired. Hence learning and its effective integration and utilisation together yield improved performance (Chirico & Salvato, 2008; Nevis et al., 1995; Senge, 1990).

In this light, probable explanations for the lack of relationships in H4a, H4c, and H6 may be associated with KIUS and resource availability in family SMEs. As discussed previously, KIUS is influential for the firm's development and adaptation. Moreover, some studies (Ellinger, Ellinger, Yang, & Howton, 2002; Sorenson & Sørensen, 2001)

highlight that a positive effect of learning on firm performance will partly be dependent upon resource availability

Similar to Section 5.4.1, an additional test was conducted to explore these possible explanations. As discussed previously, this analysis is also limited only to the resource availability explanation as data from BLS do not enable a test of the KIUS explanation. Using equity capital as a proxy, the moderating effect of resource availability on the relationship between organisational learning and performance was explored. Regression results did not support this explanation (see Appendix F - Table F.2). Instead the results further strengthen the explanation that the lack of KIUS could be the more likely reason for the lack of support for H4a, H4c and H6.

This section discussed the results concerning organisational learning and lagged firm performance. The results found that *management development* and *shared vision* (formal planning) in family SMEs are linked with enhanced performance. The significance of management development concerns to organisational learning was highlighted in the light of nurturing an organisation's learning culture. The shared vision was discussed with regard to a sense of commonality and coherence in family firms. The lack of relationships in H4a, H4c, and H6 was explained in terms of KIUS and resource availability in family SMEs.

5.4.3 INNOVATION AND FIRM PERFORMANCE

To address Research Question 3a, concerning the relationship between *innovation* and *firm performance,* the third regression analysis was conducted. Hypothesis (H7) relating to this Research Question was supported in terms of both growth of sales ($p < 0.01$) and the rate of return on total assets ($p < 0.05$), suggesting that performance of Australian

manufacturing family SMEs is enhanced through their innovation. This finding is consistent with previous innovation research (Banbury & Mitchell, 1995; Bhaskaran, 2006; Calantone et al., 2002; Craig & Dibrell, 2006; Yamin, Gunasekaran, & Mavondo, 1999).

Innovation in an organisation is influenced by many factors (Damanpour, 1991; Kim, 1980; Kimberly & Evanisko, 1981; Mohr, 1969). Research (Ogbonna & Harris, 2000) that investigated the effect of organisational structures on innovation performance has found that firms adopting flexible organisational structures yield better performance than firms that do not. It is recognised that firms that demonstrate flexibility are able to quickly reconfigure their resources and capabilities to focus on the opportunity in the marketplace (Wang, 2008). Indeed, family businesses can be considered as a classic example of firms adopting flexible organisational structures (Colli, 2003; Menkhoff & Kay, 2000) in light of their flexible processes and less formalised decision-making, open channels of communication (Colli, 2003; Daily & Dollinger, 1992; Miller & Le Breton-Miller, 2005) and clan-like cultures (Moores & Barrett, 2002; Moores & Mula, 2000). Most likely, flexible structures in family firms increase the performance through innovation (Craig & Dibrell, 2006). Moreover, some researchers (e.g. Habbershon & Williams, 1999, Miller and Le-Breton Miller, 2005) have found that family firms have unique characteristics (for example, long-term commitment and employee empowerment) that are positively related to the implementation of innovation (Gudmundson et al., 2003). Thus, the positive relationship found in this study between innovation and performance of family SMEs may be a result of their flexible organisational structures and unique characteristics.

Innovation is vital to firm long-term sustainability and better performance. Utilising extant literature, this study stressed the importance of innovation as a crucial means to achieve better firm performance. Our investigation concerning innovation and firm performance found product and process innovation in family SMEs is linked with their enhanced performance.

5.4.4 INDIRECT EFFECT OF INNOVATION

To address Research Question 3b, concerning the indirect (intervening) effect of *innovation* between *organisational learning* and *firm performance,* the linear regression test was conducted as suggested by Baron and Kenny (1986) and Frazier et al, (2004). The results indicate that the effect of networks (a dimension of the organisational learning construct) on firm performance (growth of sales) is fully intervened by firm innovation, supporting our Hypothesis 8.

This finding suggests that network relationships affect firm performance indirectly through innovation, and more importantly, suggests that the presence of innovation–oriented cultures facilitates better firm performance from learning. This finding is consistent with Menon and Varadarajan's (1992) work, which asserted that a pro-innovation culture facilitates information sharing and use. However, the intervening effects of innovation between commitment to learning, shared vision and firm performance were not tested because commitment to learning and shared vision did not meet the preconditions necessary for testing the effects. With respect to the intervening effect of innovation between organisational learning and firm performance, research findings to date are scant. Therefore, further studies are required to deepen our understanding of this phenomenon.

5.5 BETWEEN FAMILY AND NON-FAMILY ANALYSIS AND TEST RESULTS

To address Research Question 4, comparing the effects of organisational learning, innovation and firm performance between family and non-family SMEs, Chow tests were conducted.

Prior to conducting Chow tests, separate regression tests for non-family SMEs were conducted so as to identify the statistical significance of relationships between organisational learning, innovation and firm performance in the non-family SMEs. Regression results showed that employee training ($\beta = 0.172$, $p < 0.05$), management development ($\beta = 0.232$, $p < 0.01$) and formal planning ($\beta = 0.0.118$, $p < 0.1$) were statistically significant in explaining the relationships between organisational learning and performance in the non-family SMEs. Concerning organisational learning and innovation the results showed that except networks ($\beta = 0.0.150$, $p < 0.1$) all variables in organisational learning were statistically insignificant for the non-family SMEs. With regard to innovation and firm performance the results showed a significant positive relationship between innovation and firm performance at the 95% confidence level ($\beta = 0.0.193$, $p < 0.05$).

Based on the regression results of family and non-family SMEs, six hypotheses (H_{9a}, H_{9b}, H_{9c}, H_{10}, H_{12c} and H_{14}) could not be tested because of insignificant beta coefficients of predictor variables. Therefore, only five hypotheses (H_{11}, H_{12a}, H_{12b}, H_{13} and H_{15}) having significant beta coefficients, were tested using the Chow test.

Table 5.3 summarises the variables used in comparing the effects of organisational learning, innovation and firm performance between family and non-family SMEs based

on our prior regression results. The results of the hypothesis tests concerning Research Question 4 are summarised in Table 5.4.

TABLE 5-3 VARIABLES USED FOR COMPARISON

Relationships	Constructs/Dimensions	Variables used
Organisational learning and innovation	Networking	Networks
	Innovation	Product & process innovation
Organisational learning and firm performance	Commitment to learning	Employee training Management development
	Shared vision	Formal planning
	Firm performance	Growth of sales
Innovation and firm performance	Innovation	Product & process innovation
	Firm performance	Growth of sales

TABLE 5-4 HYPOTHESIS TESTING RESULTS

	Hypotheses	Results
Research Question 4: Do the relationships and patterns in family SMEs differ from those of non-family SMEs?		
H11	The relationship between networking (*external networks*) and innovation is stronger in family SMEs than in non-family SMEs.	Supported
H12	The relationship between commitment to learning (*H12a - employee training and H12b - management development*) and performance is stronger in family SMEs than in non-family SMEs.	H12(a) - Unsupported H12(b) - Unsupported
H13	The relationship between shared vision (*formal planning*) and firm performance is stronger in family SMEs than in non-family SMEs.	Supported
H15	The relationship between innovation and performance is stronger in family SMEs than in non-family SMEs.	Supported

5.6 DISCUSSION OF "BETWEEN" RESULTS

As predicted, Hypothesis 11 was supported, sustaining the notion that the relationship between *networking* (networks) and *innovation* is stronger in family SMEs than in non-family SMEs. Further to the previous discussion about networking benefits, extant literature has highlighted that the relational contacts of family firms with members in external networks may provide several advantages over professional managers in forming and sustaining personal business contacts (Fadahunsi, Smallbone, & Supri, 2000; Miller & Le Breton-Miller, 2003). Owner-managers display more idiosyncratic and particularistic behaviour compared with professional managers with regard to who they choose to include in their networks (Carney, 2005). These relationships foster trust among the network members, thereby facilitating the exchange of information and knowledge (Jones & George, 1998; Wu et al., 2008) which eventually results in a competitive advantage, consistent with a resource-based view. A possible reason why networks in family firms are stronger than those in non-family firms in creating innovations lies in the relational nature of the networks they formed.

Hypothesis 13, that the relationship between *shared vision* (formal planning) and *firm performance* is stronger in family SMEs than in non-family SMEs, was also supported as predicted. As far as formal planning is concerned, previous research (Sharma et al., 1997) suggests that although basic strategic planning is similar for both family and non-family firms, differences may exist with regard to the specific goals, how the strategy is implemented, and the participants in the processes. Long-term commitment of family members (Le Breton-Miller & Miller, 2006), their ability to convey the firm's vision to others, especially to family members (Hoy & Verser, 1994), familial ties (Silva et al., 2006), goal congruence (Denison et al., 2004, Harbbershon & Williams, 1999),

cohesiveness (Harbbershon & Williams, 1999), active involvement of family members in planning and implementation process, higher participation of family members in the board of directors (Rue & Ibrahim, 1996; Upton et al., 2001), and strategic flexibility (Zahra et al., 2008) are the distinctive characteristics in family firms. These characteristics more likely generate more favourable results in formulating, implementing and monitoring planning in family firms than in non-family firms. That is, their family-like cultures facilitate a consensual approach to strategy which is likely to be more effective (Fletcher, 2002) in achieving better results.

Similarly, Hypothesis 15, that the relationship between *innovation* and *performance* is stronger in family SMEs than in non-family SMEs, was also supported as predicted. In their study of Swedish family firms, Hall, Melin and Nordqvist (2001) found that family business cultures were an important influence on an organisation's ability to adopt radical changes. From this perspective, it can be suggested that in family firms, cultural dimensions that facilitate rapid and effective responses to environmental change and new opportunities will have a greater effect on innovation than in non-family firms (Gudmundson et al., 2003). Moreover, evidence (Ogbonna & Harris, 2000; Pierce & Delbecq, 1977) indicates that innovation is likely to require some degree of flexibility in organisational structure. As discussed, open channels of communication, informal decision-making, flexibility in processes and procedures (Colli, 2003; Daily & Dollinger, 1991; Mintzberg, 1979), clan-like cultures (Moores & Barrett, 2002; Moores & Mula, 2000), and employee empowerment (Gudmundson et al., 2003; Özsomer, Calantone, & Di Benedetto, 1997) are common themes associated with flexible organisational structures, that are conducive to greater entrepreneurial and innovative activity (Mintzberg, 1979). Hence, firms with a more flexible structure and a creative

culture will arguably have higher rates of innovation than other firms (Gudmundson et al., 2003; Özsomer et al., 1997). As discussed previously, family firms tend to have structures that adopt less formal decision-making, flexible processes and control procedures, and open channels of communication than non-family firms (Colli, 2003; Daily & Dollinger, 1992; Miller & Le Breton-Miller, 2005). Consequently, family firms may be better able to leverage their innovation for firm performance than non-family firms. The current research provides empirical evidence to strengthen this argument.

However, the Chow test results did not support the relationships predicted in Hypotheses 12a and 12b. It has been shown that the predictor variables, namely employee training and management development, of these two hypotheses are closely related to the human resources development aspect associated with organisational learning. The findings of this research echo those of Kotey and Folker (2007) and Reid, Morrow, Kelly, and McCartan (2002), in that those researchers found employee training and development to be lower in family firms compared to their non-family counterparts. Perhaps lower training and development in family SMEs may be the reasons associated with these results.

In summary, hypotheses comparing the effects of organisational learning on innovation and firm performance between family and non-family SMEs found a stronger effect of (a) *networking* (networks) on innovation (b) *shared vision* (formal planning) on firm performance, and (c) *innovation* (product and process innovation) on firm performance in family SMEs compared with those of non-family SMEs. In the case of management development and employee training, their effects on firm performance are stronger in non-family SMEs than in family SMEs.

5.7 CHAPTER SUMMARY

This chapter first re-visited the research overview. Then, it summarised the results in the form of within family SMEs and between family and non-family SMEs and discussed them using family business and related literature. The findings of the research concerning organisational learning, innovation and firm performance within family SMEs and between family and non-family SMEs were discussed in the light of trust, enduring relationships, KIUS, availability of resources, organisation's learning culture, organisational structures and distinctive characteristics of family firms.

CHAPTER SIX

6. CONCLUSION

6.1 INTRODUCTION

This chapter provides the conclusion to the research. It consists of six sections including this introduction. In Section 2 conclusive findings of the research are presented. An assessment of the research contribution is provided in Section 3. Section 4 outlines the limitations of the research. Avenues for further research are provided in Section 5. Finally, Section 6 presents the concluding remarks of the research.

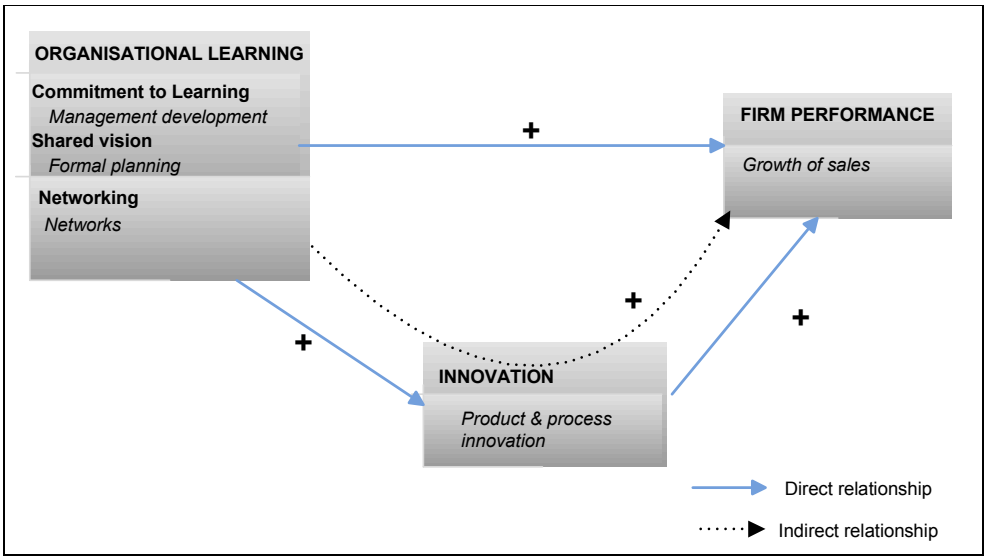
6.2 CONCLUSIVE FINDINGS

This study explored two main research themes. First, it explored the direct and indirect effects of organisational learning on innovation and firm performance within family SMEs. Second, it explored the effects of organisational learning on innovation and firm performance between family and non-family SMEs.

The findings of the research concerning the direct effects of organisational learning on firm performance within family SMEs showed that certain organisational learning variables, namely *management development* and *shared vision* (formal planning), were positively linked with their *performance*. In the case of the direct effect of organisational learning on innovation, external *networks* were found to positively influence *innovation* in family SMEs. Moreover, relating to innovation and firm performance, our research concludes that *innovation* (product and process) in family SMEs is positively linked with their *performance*.

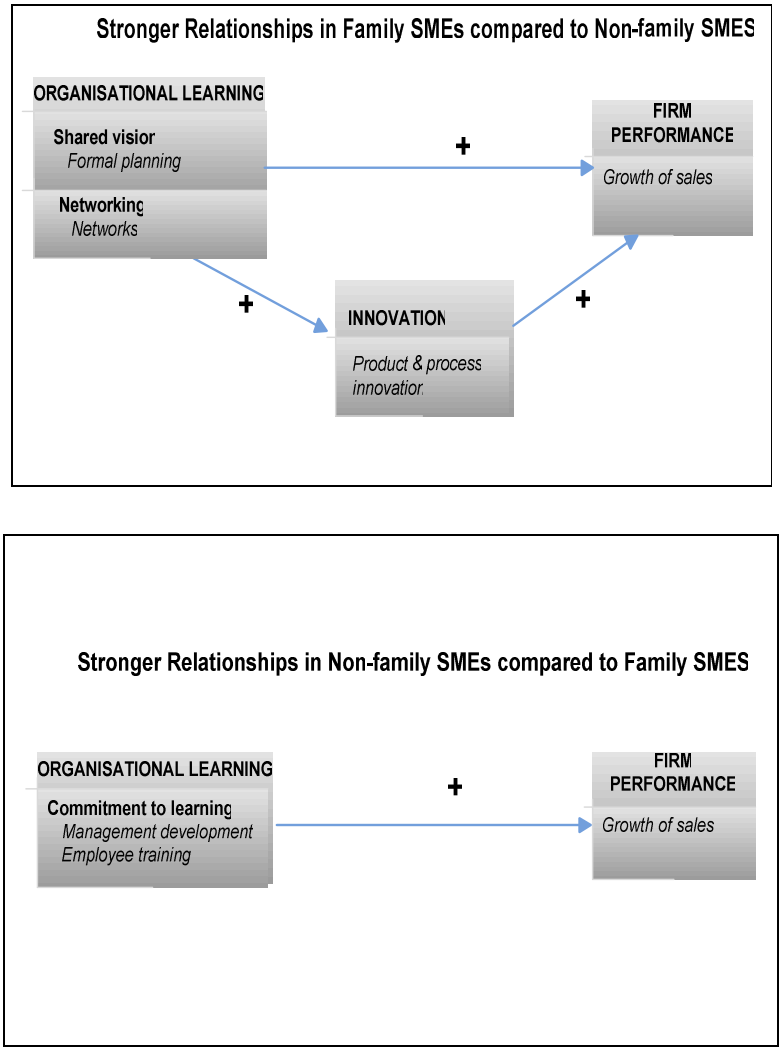
Concerning the indirect effects, the research found that *networking* (networks) had an effect on firm p*erformance* via *innovation*. This finding highlights that when a family SME creates an innovation-oriented culture, that culture facilitates better performance from learning. The organisational learning, innovation and firm performance links found significant in the first theme are shown in Figure 6.1.

FIGURE 6-1 LEARNING, INNOVATION AND PERFORMANCE: WITHIN FAMILY SMES



The findings of the second theme, which explored the effects of organisational learning, innovation, and firm performance between family and non-family SMEs, showed that *shared vision* (formal planning) and *innovation* (product and process) were more positively effective in the *performance* of family SMEs than non-family SMEs. Moreover, the effects of *networks* were found to be stronger in family SMEs for *innovation* than in non-family SMEs. However, the findings suggest that *commitment to learning* (management development and employee training) were more effective for the *performance* of non-family SMEs than family SMEs. Figure 6.2 shows the findings relating to the second theme.

FIGURE 6-2 LEARNING, INNOVATION AND PERFORMANCE: BETWEEN FAMILY AND NON-FAMILY SMES



6.3 CONTRIBUTION OF THE RESEARCH

In terms of scholarship, a trend is emerging in the family business field to integrate the thinking from multiple disciplines (Sharma et al., 2007). This research focused on strategic change and adaptiveness in family firms, in particular family SMEs, from within the organisational learning perspective, an area where research has been particularly scarce (Chirico & Salvato, 2008; Hatum & Pettigrew, 2004). This research has provided several significant contributions to the theory, research and practice in the fields of family business, organisational learning, and innovation.

6.3.1 CONTRIBUTION TO THEORY

In this research, the network relationships of family SMEs were found to be important determinants of organisational innovation. Although prior literature has highlighted the importance of networks for innovation and firm performance from an organisational learning perspective, little research has empirically tested this relationship (Calantone et al., 2002; Huber, 1998). Therefore, our finding concerning network relationships and innovation provides a significant contribution to the existing RBV literature on family firms.

The findings relating to organisational learning and firm performance empirically confirmed that shared vision (formal planning) and management development are influential determinants that drive better performance in family SMEs. These findings strengthen the notion that the adoption of formal planning and management development in family SMEs contributes to enhancing firms' performance and competitive edge. They are also a contribution to the literature in the field.

This research contributes to the stream of innovation research. It provides further supportive evidence to substantiate the positive relationship found in previous research relating to innovation and firm performance. More specifically, the findings of this research contribute to advancing the body of knowledge pertaining to the relationship between innovation and family SMEs performance, an area in which empirically tested innovation studies are scarce. Moreover, this study found the indirect effect of networks on firm performance via innovation. This is an added contribution to the organisational learning, innovation, and family business research.

A key concern in family business studies is whether family firms differ from professionally managed firms. Many have found that family firms differ from non-family firms with respect to patterns of influence, organisational climate, and organisational processes (File, Prince, & Rankin, 1994). This research examined the effects of organisational learning, innovation and firm performance between family and non-family SMEs. The comparative analysis provided three important findings.

The finding with regard to shared vision (formal planning) and firm performance demonstrates that family SMEs outperformed non-family SMEs because of their learning through a sense of commonality and coherence. This finding contributes to the positive view of "familiness resources" (Habbershon & Williams, 1999), highlighting family involvement as a distinctive resource influencing the performance of family firms (Habbershon, n.d.)

The finding relating to innovation and firm performance suggests that innovation in family SMEs enhances their performance because of the organisational structures and innovation-cultures they adopt. This finding contributes to the organisational literature, suggesting that flexible organisational structures adopted in family SMEs (Colli, 2003; Menkhoff & Kay, 2000) likely facilitate better performance by encouraging innovations. Moreover, it also contributes to the literature concerned with innovation-oriented cultures and firm performance.

Furthermore, the research indicates the importance of networking for firm innovation. It suggests that family SMEs are more innovative than non-family SMEs because of high levels of trust and enduring relationships they build with networks. This finding

contributes to the RBV of family firms (Habbershon & Williams, 1999) highlighting that social interaction is a key resource influencing the success of family firms.

6.3.2 CONTRIBUTION TO RESEARCH

This research has provided several significant contributions to the fields of organisational learning, innovation and family business research, particularly in the light of research context, conceptualisation and methodology.

The concept of organisational learning has enjoyed enormous popularity in the literature as a vehicle for creating and enhancing firms' strategic resources. Yet, knowledge about its impact on SMEs, particularly family SMEs, is very limited. Most previous learning research has been undertaken in the context of large and widely-held firms. This research was undertaken in the context of manufacturing family SMEs by developing an integrated conceptual framework using cross-disciplinary literature. The use of SMEs and an integrated approach for this study provide a contextual and conceptual contribution to the research.

There is an expanding body of research in the field of organisational learning. However, most of the research to date has been North American or European in context and little research has been undertaken in other geographical regions. Thus, the location of this research in another continent will help to extend the existing body of knowledge to understand the manner in which organisational learning affects innovation and firm performance in different contexts. This is a contextual contribution of the research.

Previous researchers have not attempted to develop a research framework to assess the intervening effect of innovation between organisational learning and firm performance. The theoretical framework elaborated in Chapter Two, which bridges the streams of

organisational learning and firm performance, linking the intervening effect of innovation itself, makes a significant contribution to the domain of organisational learning and innovation research in general and in family SMEs in particular. This approach provides a conceptual contribution to the research.

In ascertaining the causal relationships between the explained variable and the predictor variables of organisational learning research, past studies have relied extensively on cross-sectional data (Baker & Sinkula, 1999; Calantone et al., 2002; Farrell, 2000; Farrell & Oczkowski, 2002; Hurley & Hult, 1998; Mavondo et al., 2005; Therin, 2002). Although an acknowledged weakness of cross-sectional data is that causality is much harder to infer (Dawes, 2000), no previous research would appear to have used longitudinal data. Hence, the use of longitudinal data in this research provides a valuable contribution to research methodology in the area of organisational learning research. Moreover, it was found that no previous organisational learning research has taken the lag effect into consideration. Thus the incorporation of a lag effect into this research model has provided an additional methodological contribution to the organisational learning research stream. Notwithstanding this, an ability to lag by only one year is discussed as a potential limitation in Section 6.4.

This research has contributed to the Habbershon and Williams' (1999, p.16) "family firm resources and firm performance model" that outlines that the learning outcomes are the antecedents to family firm performance. That is, they suggest that learning in family firms does affect their performance. In our research we provide some empirical evidence of how a learning orientation supports their suggestion in the context of Australian manufacturing family SMEs.

Highlighting the long tenure of CEOs, network capabilities, and respect for traditions and histories, Moores (2009) accentuates that family businesses are better able to develop learning orientation by accumulating, disseminating, and sharing knowledge than non-family firms. However, he emphasises the paucity of research in family business using learning theory compared to more established theories (e.g. agency and resource-based view). Thus, our use of learning theory has contributed to extending the theoretical base in family business research.

6.3.3 CONTRIBUTION TO PRACTICE

The findings of this research provide important contributions for practitioners and policy-makers in developing policies and strategies for promoting SMEs, particularly family SMEs,

This research showed the positive effect of formal planning and management development on firm performance and of networking on innovation. This underscores the importance of encouraging networking, formal planning and management development in family SMEs for sustaining their survival and improving their performance. Thus, practitioners and policy-makers are advised to consider these findings in designing programs that support SME development. Furthermore, these findings should be beneficial for advisors and business development institutions when providing business advice and assistance for family SMEs.

The research reported insignificant relationships between certain organisational learning variables, innovation and firm performance links of family SMEs. As discussed previously, a likely reason for this unexpected lack of correlation may be the conservative approach of family firms (Zahra et al., 2008) with regard to KIUS in

leveraging their knowledge and skills resources for organisational adaptation and development. Although resource availability is often suggested as an issue for SMEs (Festing, 2007; Tiwari & Buse, 2007; Tung & Aycan, 2008; Wickramansinghe & Sharma, 2005) in utilising new knowledge and skills, this study recognised, alternatively, that KIUS likely play a more critical role than resource availability in putting knowledge and skills to use. Hence, this research sheds light on the significance of the creation of effective KIUS in SMEs, which practitioners may need to consider in developing procedures and systems for family SMEs.

In the area of small and medium sized business studies in general and family SMEs in particular, there is a lack of understanding of the importance of organisational learning for firm performance and innovation. Therefore, the framework presented and empirical evidence found in this research will assist classroom discussion and should also help in providing training for entrepreneurs and would-be entrepreneurs.

6.4 LIMITATIONS OF THE RESEARCH

It is important that in any research, limitations must be recognised and acknowledged so that the validity, reliability and generalisability of findings may be properly assessed. Likewise, limitations highlight different approaches that may be useful for future research in further exploring the issues investigated. As with all research, this research has certain limitations which must be taken into consideration in evaluating and interpreting the results, findings and their contribution. Perhaps the most important limitation in this research is the age of the data used for the analysis. The BLS data were collected last decade and thus there may be a possibility that the statistical relationships identified in this research may not hold identically today. However, it is the researcher's opinion that the results reported in the research will not be affected significantly by this

limitation because of the longitudinal nature of the data. Longitudinal data have a capacity to establish a similar pattern of change and relationship over periods of time in firms and/or individuals.

Another limitation is related to the data imputation and perturbation. As noted in Chapter Three, the ABS used certain imputation and perturbation techniques for all the financial data contained in the BLS, to maintain the confidentiality of respondents and of the data. As this research was carried out using that data, there may be the possibility that the data imputation and perturbation affected the firm financial performance results in some way. However, the use of financial data for measuring firm performance added value to this research, as financial data of SMEs are rarely accessible to researchers.

Another basic limitation of this research is that it was not possible to control for the influence of industrial sectors within the manufacturing industry (e.g. high-tech and low-tech) upon the relationships tested in the research, as the BLS provides confidentialised data at ANZSIC two digits levels only. Therefore, sectoral effects may have affected the results of this research. Subject to these limitations, the results of the research provide a richer understanding of the effect of organisational learning on innovation and firm performance of family SMEs, owing to the broad representation of manufacturing family SMEs in the sample and also the longitudinal nature of the data.

From a methodological point of view, it is not easy to establish causal relationships between organisational learning, innovation and firm performance using a one-year lag effect period as established in this research. In actuality, it may sometimes take longer to identify any effect of organisational learning on innovation and firm performance, particularly in SMEs because of their conservative approach in leveraging learning for

organisational development and adaptation. Therefore, a lagged period of one-year for the constructs is still considered short, and it may be that longer periods are preferable to better discern their effects. Acknowledging this limitation, it is suggested that longitudinal data covering a period longer than three years would be preferable in assessing the relationships.

Another possible limitation of this study is related to the use of single items to measure management training, employee training, comparison of performance, and formal planning. It is typically not easy to capture the entire domain of a phenomenon of interest in just one question. However, some researchers have argued that because there appears to be no difference in the predictive validity of single-item and multiple-item measures (Bergkvist & Rossiter, 2007; Scarpello & Campbell, 1983) the use of single-item measures in research is not seen as a major issue of concern.

In conducting quantitative research it is important to determine its external validity. External validity relates to the certainty with which the findings can be generalised to the population and to other settings and conditions. This research was conducted using a sample of the Australian manufacturing SMEs. Therefore, care should be taken in generalising the findings of this research to areas other than the manufacturing industry and to other countries, as these findings are specific to the Australian manufacturing industry.

Moreover, the research method employed in this study was quantitative, using secondary data originally collected through surveys. It is acknowledged that quantitative method is more appropriate for investigating the properties and phenomena of existing knowledge and their relationships, and also more realistic when generalising the findings (Guba,

1990). However, this method has some generic limitations, such as positive response bias and reporting bias. Therefore, it is important when interpreting the results of this research to understand such limitations and also limitations associated with the use of secondary data (e.g. sampling criteria, data classification system and data entering errors) applying to it.

6.5 AVENUES FOR FURTHER RESEARCH

Based on the research findings and limitations, this study points to several further research opportunities. First, this research developed a conceptual framework for exploring the direct and indirect effects (via innovation) of organisational learning on the firm performance of family SMEs. It is particularly important to reassess this framework with another sample from another country and to confirm its applicability and generalisability to different business contexts. Moreover, cross-industry and cross-national comparative studies would enhance the generalisability and the validity of the findings reported in this research.

Second, although previous organisational learning research, which was based on widely-held firms, supported the proposition that commitment to learning and shared vision are positively correlated with innovation, this research reported no such correlation. Similarly, regression analyses reported lack of relationships between certain organisational learning variables and firm performance. As explained in the discussion section, the lack of relationships may be the results of inappropriate KIUS used in family SMEs. Therefore, further research is called for to explore KIUS in family SMEs.

Third, future research might consider how organisational learning impacts on firm performance using various performance indicators, for example product quality,

productivity, customer complaints, employee motivation, and employee retention. The findings of such research would contribute to further advancing the body of knowledge necessary for better understanding the effects of organisational learning on sustainability and performance in family SMEs.

Fourth, the findings in this research were based on managers'/owners' self reporting in the surveys. This produces certain constraints, such as a positive response bias. Therefore, it is also recommended to explore the relationships tested in this research by obtaining data from multiple sources within firms, such as interviewing employees and conducting case studies. Moreover, replication of this research with the inclusion of some other organisational learning variables would help to explore the association between organisational learning and innovation and firm performance in family SMEs from a different lens.

Fifth, perhaps another significant area for future research is the examination of network relationships in family firms, particularly in family SMEs. This research found that network relationships in family SMEs foster learning through knowledge acquisition and sharing, thereby enhancing innovations. It further found that the effects of networks on innovation are stronger in family SMEs than in non-family SMEs. In line with these findings, further research can be undertaken to explore why and how network relationships in family SMEs are different from non-family SMEs and why and how family SMEs' networks produce superior results than those of non-family SMEs. The findings of these studies would greatly contribute to deepening our understanding about the social interactions (Habbershion & Williams, 1999) of family firms.

Finally, exploration of the impact of organisational learning on firm performance across different generations of family firms is an area worthy of research[15]. According to Kelly, Athanassiou, and Crittenden (2000), founder-run family firms described as first generation family firms are likely to be particularly influential with regard to the owner/manager's mindset, motives, values, goals, and attitudes; the owner/manager may also shape the firm's strategic behaviour and its interactions with the external environment. Whereas Dyer (1998) and McConaughy and Phillips (1999) highlighted that second and subsequent generation family firms tended to utilise more professional forms of management, Aronoff (1998) asserted that they were more likely to engage in team management, with parents, children, and siblings in the firm all having equal and

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[15] To examine whether the effects of organisational learning on innovation and firm performance vary across generations, two additional tests were conducted. With regard to organisational learning and innovation, the results demonstrated that networks ($\beta = 0.279$, $p< 0.05$) positively affects innovation in first generation family firms but are insignificant in subsequent generations (see Appendix G-1). This finding is similar to the findings of McConaughy and Phillips (1999) and Okoroafo (1999). McConaughy and Phillips (1999) highlighted that first generation family firms are more innovative than subsequent generations because of their ability to exploit new ideas and the special technical or business backgrounds they possess for the creation of the business. Similarly, by investigating the internationalisation behaviour in family firms Okoroafo (1999) found that first generation owners are more likely to initiate foreign market involvement than subsequent generations. In contrast, Fernández and Nieto (2005) found that first generation family firms are less involved in international markets than subsequent generations.

Relating to organisational learning and firm performance, the results showed the positive effects of management development ($\beta = 0.286$, $p< 0.05$), formal planning ($\beta = 0.221$, $p< 0.1$), and networks ($\beta = 0.354$, $p< 0.05$), on firm performance in first generation family firms. However, there were no relationships found in subsequent generations (see Appendix G-2). These findings are similar to the findings of McConaughy and Phillips (1999). By studying founding-family controlled firms they concluded that founder-controlled family firms provide greater value to the business than descendant-controlled (second and later generations) family firms because of higher productivity of their employees. Taking organisational changes into account, Chirico & Salvato (2008) asserted that when the incumbent generation does not allow the new generation to participate in decision making, change is prevented. However, the findings of these tests are quite ambiguous in explaining organisational learning in subsequent generations. Certainly, more research is needed to unravel these ambiguous findings.

participative involvement in important decision making. Moreover, in family firms, the transfer of organisational memory within and across generations can be more easily achieved because of higher levels of relational trust between family members. This facilitates learning (Huber, 1991; Levitt & March, 1988) in these firms. These arguments suggest that the effect of learning in family firms may vary across generations (Hoy & Verser, 1994; Salvato, 2004). Extending research to focus on transgenerational learning and how it contributes to innovation and sustained performance would contribute immensely to the emerging literature that seeks to explain the potential advantages of family firms.

6.6 CONCLUDING REMARKS

The rate of change in the business environment is greater than ever before. Previous literature has repeatedly emphasised learning and its ability to create new knowledge and skills. In this respect, knowledge and skills are considered to be strategic resources and catalysts for the achievement of competitive positioning in an organisation. The phenomenon of organisational learning has been explored for some time but the significance and indispensability of organisational learning have increased sharply in recent years as a result of stringent competition, stemming largely from a rapidly changing business environment and the knowledge-based economy.

With the competitive landscape of the twenty-first century becoming increasingly dynamic and uncertain (Hamel, 2000, as cited in Kellermanns & Eddleston, 2006; Kuratko & Audretsch, 2009), it is of the utmost importance that family firms devise new strategies to innovate and retain their market positions (Zahra et al, 2008). This can be achieved by promoting learning in organisations. Learning facilitates changing existing capabilities and increasing firms' strategic adaptiveness (Chirico & Salvato, 2008), thereby

enhancing firm's competitive position. The literature states that in order for an organism to survive, its rate of learning must be equal to or greater than the rate of change in its environment (Dixon, 1999, p. 2).

Concerning family businesses, their family-like cultures (Fletcher, 2002), relationships and trust (Arregle et al., 2007, Habbershion & Williams, 1999), goal congruence, cohesiveness, participation, family meetings (Habbershon & Williams, 1999) and organisational processes have a better chance of gaining competitive advantage from learning. Such attributes have an ability to develop a platform for encouraging the level of accumulation and utilisation of employees' knowledge and skills for organisational adaptation and development. Moreover, some research (Chirico & Salvato, 2008; Sharma & Irving, 2005) asserted that because the family business structure is based on close interaction of kinship ties and reciprocal trust, integration of knowledge, especially tacit knowledge is easier in family firms than in non-family firms. This may enable a family firm to create learning to adapt to environmental changes. However, research in this area is still in its infancy.

To conclude, it is essential to re-emphasise the necessity for more scholarly studies in organisational learning in family firms because knowledge is the one sure source of lasting competitive advantage in an uncertain environment (Nonaka, 1991, p.96). Undertaking further studies linking organisational learning with family business characteristics such as familiness, leadership, ownerships (lone founder and multiple family owners), social interactions and organisational processes will be beneficial to expanding the body of knowledge on learning and its effects on performance of family firms.

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8. APPENDICES

Appendix A Approval to access CURF on CD-ROM

From: Pam Palmer [pam.palmer@abs.gov.au]
Sent: Wednesday, 2 April 2008 1:20 PM
To: Pradeep Dharmadasa
Cc: Michael Wallace
Subject: Approval to access CURF on CD-ROM (Ref No. 2432)
[SEC=UNCLASSIFIED]

Dear Pradeep

Thank you for your CURF Request to access the following CURF on CD-ROM now approved for use in your university:

App. No.	CURF	Format
2432	Business Longitudinal Survey (1994-98)	Basic on CD-ROM

You are now authorised to access the CURF which can be obtained from your Contact Officer. As an authorised user, you are required to read the 'Responsible Access to ABS CURFs Training Manual' (see attached). This CURF will be mailed out today.

Each year, the Microdata Access Strategies Section will email your Contact Officer with your university's Annual Renewal forms. You will be required to provide details of your CURF use in the previous year including published output. As the Annual Renewal is part of the CURF access administrative procedures, failure to provide the information in the required time to your Contact Officer, may result in withdrawal of access to CURFs for you and/or your university. For more information on the Annual Renewal process please refer to the *'Frequently Asked Questions - Annual Renewal Process of CURF Microdata'* page on the website (www.abs.gov.au).

We have filed your original Application and Undertaking forms. Copies can be forwarded to your university's CURF Contact Officer upon request.

Please note you must notify your university's CURF Contact Officer that you are leaving the university at least ten working days prior to you departing, and return any CURF CD-ROMs to them. When you leave your university, you must not take copies of CURF microdata or CD-ROMs with you, or continue to access CURFs via the ABS RADL. If you wish to regain access to any CURF microdata in your new location you must apply for access through your new university's CURF Contact Officer.

We invite you to keep up to date with CURFs by referring to the CURF Microdata pages on the ABS web site:
http://www.abs.gov.au/websitedbs/D3310114.nsf/home/CURF:+Microdata+Entry+Page?OpenDocument

Please contact me if you require any further information.

Kind regards,

Pam Palmer
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Email: microdata.access@abs.gov.au
CURF Microdata homepage

Appendix B Some Previous Research Undertaken Using BLS Data

JOURNAL ARTICLES

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*Researcher's references

Appendix C The BLS Questionnaire Items Used in this Study

Question #	BLS item	1995/96	1996/97	1997/98
5	What is the legal status of the business?	✓	✓	✓
14 (95/96)* *13 (96/97 & 97/98*)*	Do you consider this business to be a family business?	✓	✓	✓
15 (97/98)*	Including the current operators, how many generations of this family have been either working directors, partners or proprietors of this business?			✓
17 95/96)* *16 (96/97 & 97/-98*)*	If this business has more than one working proprietor, working partner or working director, how many are from the same family?	✓	✓	✓
68 (95/96)* *79 (96/97*)* *69 (97/98*)*	Please estimate the percentage breakdown of this business's equity or ownership.	✓	✓	✓
27	Did this business use any of the following business practices?			
	A formal business plan	✓		
	Formal networking with others	✓		
	Comparison of performance with other businesses	✓		
32	Please indicate if there have been any major changes in the business			
	Management development	✓		
	On-the-job training	✓		

* Questions included in the year of survey

43	Did this business (a) develop any new products, or (b) introduce any substantially changed products, or (c) develop or introduce any new or substantially changed process.		✓	
	What was the estimated expenditure on the development of the new products or processes for?			
44	*Research and development*		✓	
	Acquisition of technology by others (patents, trademarks and licenses)		✓	
	Expenditure for tooling-up, industrial engineering and start-up		✓	
	Marketing of new or improved products		✓	
45 (96/97) 40 (97/-98*)*	Income from sales and services		✓	✓
6	How many years has business been owned/controlled by the present owners?			✓
17	Number of persons working for this business during the last pay period ending in June 1998.			✓
56(95/95) 63(96/97*) 58(97/98*)*	Reported operating profit or loss (surplus or deficit) before tax and extraordinary items.	✓	✓	✓
47(95/95) 54(96/97*) 49(97/98*)*	Interest expenses	✓	✓	✓
48(95/95) 55(96/97*) 51(97/98*)*	Deprecation and amortisation	✓	✓	✓
54(95/95) 61(96/97*) 56(97/98*)*	Opening trading stocks	✓	✓	✓
55(95/95) 62(96/97*) 57(97/98*)*	Closing trading stocks	✓	✓	✓

58(95/95)* *65(96/97*)* *60(97/98*)*	Current assets	✓	✓	✓
59,60,61(95/95)* *66(96/97*)* *61(97/98*)61*	Non-current assets.	✓	✓	✓

Appendix D Regression Results Used to Determine the Intervening Effects

	STEP - 1•	STEP - 2•	STEP - 3•	STEP - 4•
Independent variable:				
Employee training	0.003 *(0.026)*	*0.107* *(1.071)*		*0.024* *(0.233)*
Management development	0.142* *(1.465)*	*0.029* *(0.308)*		*0.172*** *(1.858)*
Comparison of performance	0.119 *(1.218)*	*0.091* *(0.963)*		*0.073* *(0.766)*
Formal planning	0.149* *(1.487)*	*0.040* *(0.410)*		*0.212*** *(2.295)*
Networks	**0.199**** *(2.049)*	***0.179**** *(1.921)*		***0.101*** *(1.056)*
Innovation			***0.334***** *(3.550)*	
Control variables:				
Firm size (Ln - employees)	0.004 *(0.041)*	*-0.296**** *(-3.180)*	*0.113* *(1.171)*	*0.098* *(1.023)*
Firm age	-0.032 *(-0.330)*	0.011 *(0.120)*	-0.019 (-0.201)	-0.045 (-0.491)
Past performance	0.016 *(0.159)*	*-0.124** *(-1.307)*	*0.062* *(0.651)*	*0.123** *(1.348)*
Innovation				*0.354 **** *(3.923)*
Employee training			*-0.029* *(-0.312)*	
Management development			*0.142** *(1.547)*	
Comparison of performance			*0.103* *(1.108)*	
Formal planning			*0.151** *(1.594)*	
Networks			*0.130** *(1.386)*	
Intercept	2.818* *(1.488)*	*9.286**** *(4.359)*	*-0.012* *(-0.006)*	*0.273* *(0.129)*
R square	0.040	0.129	0.146	0.188
F-value	4.200**	7.508***	8.639***	7.728***
Max VIF	1.079	1.104	1.109	1.136

NoteN =104, t values are in parentheses.

*** *Significant at the 99% confidence interval* (one-tailed)

** *Significant at the 95% confidence interval* (one-tailed)

* *Significant at the 90% confidence interval* (one-tailed)

- As Baron and Kenny (1986) suggested, four-step procedure was followed to measure the intervening effect of innovation between organisational learning and firm performance. In Step 1 organisational learning was regressed on firm performance without controlling for innovation. Step 2 regressed organisational learning on innovation. Innovation on firm performance was regressed in Step 4. Finally, in Step 4 organisational learning was regressed on firm performance controlling for innovation.

Appendix E Chow Test Results

	Unrestricted Model		Restricted Model	$F = \frac{(RSS_R - RSS_{UR})/k}{(RSS_{UR})/(n_1 + n_2 - 2k)} \sim F[k, (n_1 + n_2 - 2k)]$	F-critical
	Family	Non-family			
Hypothesis 11 - Networking and organisational learning					
RSS	2424.3	16507.9	19631.70	3.884**	3.037
Hypothesis 12a – Employee training and firm performance					
RSS	22510.50	56257.52	81450.15	3.589**	3.037
Hypothesis 12b – Management development and firm performance					
RSS	22142.64	55066.41	81518.59	5.762**	3.037
Hypothesis 13 – Formal planning and firm performance					
RSS	21761.33	55758.44	80031.321	3.421**	3.037
Hypothesis 15 - Innovation and firm performance in terms of sales growth					
RSS	22126.57	27467.59	81807.458	4.123	3.037
Hypothesis 15 - Innovation and firm performance in terms of ROTA					
RSS	12113.12	27467.59	40401.483	2.214*	1.621

RSS = Sum of squared residuals

**** Significant at the 99% confidence interval* (one-tailed)
*** Significant at the 95% confidence interval* (one-tailed)
** Significant at the 90% confidence interval* (one-tailed)

Appendix F The Moderating Effects of Equity Capital on the Relationship between Organisational Learning and Innovation

Resource availability is often highlighted in the literature (Festing, 2007; Lo & Humphreys, 2000; Tiwari & Buse, 2007; Tung & Aycan, 2008; Wickramansinghe & Sharma, 2005) as a factor affecting innovation and performance of SMEs. Taking resource availability into account as a possible reason for the non-significant results reported between organisational learning, innovation and firm performance relationships in this study, two additional tests were conducted. These tests assess whether resource availability influenced the generation of more positive effects from organisational learning. Choosing equity capital as a measure of resource availability, and using a procedure suggested by Jaccard and Turrisa (2003), the moderating effects of resource availability on the relationships between organisational learning, innovation and firm performance were tested.

Concerning organisational learning and innovation, the regression results in Table F.1 show that neither the direct effects of equity capital on innovation ($\beta = -0.008$; $p > 0.10$) nor the moderating effects of equity capital on the relationship between organisational learning and innovation (employee training $\beta = 0.006$; $p > 0.10$, management development $\beta = 0.028$; $p > 0.10$, comparison of performance $\beta = 0.003$; $p > 0.10$, formal planning $\beta = 0.003$; $p > 0.10$ and networks $\beta = -0.006$; $p > 0.10$) were statistically significant. This does not support the moderating effects of resource availability; instead the results highlight the need to further explore the non-significant relationship between organisational learning and innovation. As indicated in Chapter Five, a highly likely reason for this lack of relationship could be the lack of KIUS in family SMEs.

Similarly, the second additional test analysed the moderating effects of equity capital on the relationship between organisational learning and firm performance. The results in Table F.2 show a significant positive relationship between management development and firm performance ($\beta = 0.172$, $p < 0.05$) and further show that the relationship improved with the moderating effects of resource availability ($\beta = 0.249$, $p < 0.01$). Moreover, the results indicate that the model overall is significant (adjusted $R^2 = 0.199$; $F = 9.516$; $p < 0.01$) and the change in R^2 ($\Delta R^2 = 0.035$) indicates an additional contribution to the moderating term.

However, the moderating effects of resource availability on other learning variables are non-significant (employee training $\beta = 0.074$; $p > 0.10$, comparison of performance $\beta = 0.035$; $p > 0.10$, formal planning $\beta = 0.150$; $p < 0.10$ and networks $\beta = -0.063$; $p > 0.10$).

Overall, these results reject the moderating effects of resource availability. This result also suggests that a highly likely reason for the lack of relationship between learning and firm performance could be the lack of KIUS in family SMEs.

TABLE F-1 THE MODERATING EFFECTS OF EQUITY CAPITAL ON THE RELATIONSHIP BETWEEN ORGANISATIONAL LEARNING AND INNOVATION

	Control	Direct effects	Moderating effects
Firm size	-0.312*** *(-3.322)*	-0.296*** *(-3.180)*	-0.296*** *(-3.180)*
Firm age	-0.011 *(-0.116)*	0.011 *(0.120)*	0.011 *(0.120)*
Past performance	-0.081 *(-0.861)*	-0.124* *(-1.307)*	-0.124* *(-1.307)*
Employee training		0.107 *(1.071)*	0.107 *(1.071)*
Management development		0.029 *(0.308)*	0.029 *(0.308)*
Comparison of performance		0.091 *(0.963)*	0.091 *(0.963)*
Formal planning		0.040 *(0.410)*	0.040 *(0.410)*
Networks		0.179** *(1.921)*	0.179** *(1.921*
Equity capital		-0.008 *(-0.073)*	-0.008 *(-0.073)*
Employee training x Equity capital			0.006 *(0.062)*
Management development x Equity capital			0.028 *(0.292)*
Comparison of performance x Equity capital			0.003 *(0.025)*
Formal planning x Equity capital			0.003 *(0.026)*
Networking x Equity capital			-0.006 *(-0.048)*
R^2	0.098	0.129	0.129
R^2 (Adjusted)	0.089	0.112	0.112
F- value	11.036***	7.508***	7.508***
ΔR^2		0.032	0.032
Max VIF	1.000	1.008	1.008

N= 104, t values are in parentheses
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

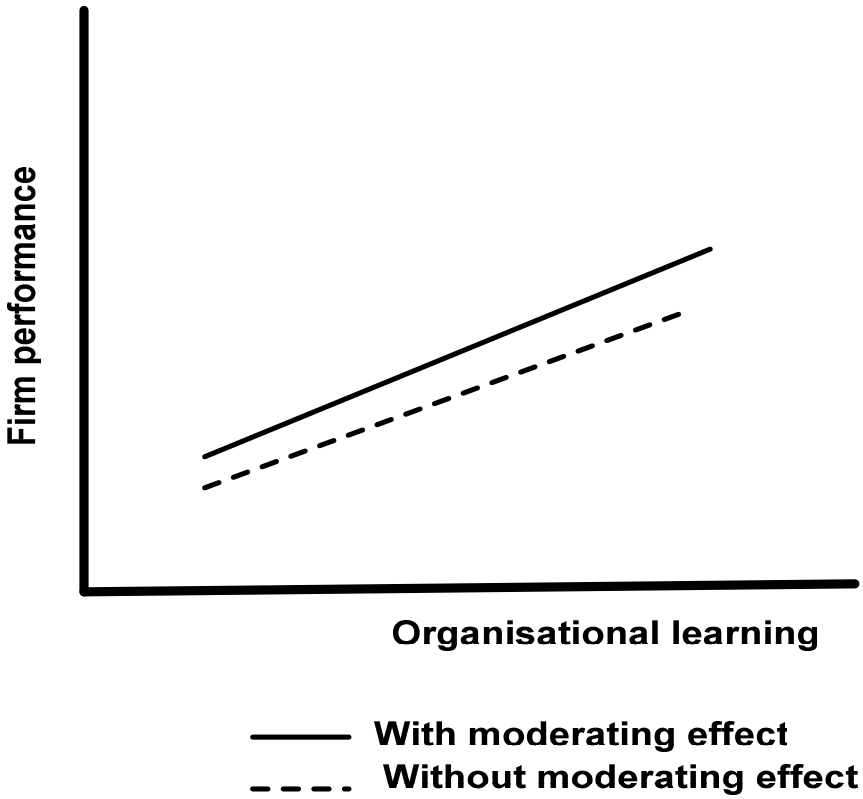
TABLE F-2 THE MODERATING EFFECTS OF EQUITY CAPITAL ON THE RELATIONSHIP BETWEEN ORGANISATIONAL LEARNING AND FIRM PERFORMANCE[16]

	Control	Direct effects	Moderating effects
Firm size	0.109 *(1.1270*	0.098 *(1.023)*	0.139* *(1.461)*
Firm age	-0.035 *(-0.3720*	-0.045 *(-0.491)*	0.004 *(0.047)*
Past performance	0.088 *(0.948)*	0.123* *(1.348)*	0.160** *(1.790)*
Innovation	0.360*** *(3.901)*	0.354*** *(3.923)*	0.344*** (3.895)
Employee training		0.024 *(0.233)*	0.020 *(0.215)*
Management development		0.172** *(1.858)*	0.049** *(1.754)*
Comparison of performance		0.073 *(0.766)*	0.080 *(0.860)*
Formal planning		6.919** *(2.295)*	0.186** *(2.107)*
Networks		0.101 *(1.056)*	0.089 *(0.950)*
Equity capital		-0.063 *(-0.681)*	0.090 *(0.828)*
Employee training x Equity capital			0.074 *(0.614)*
Management development x Equity capital			0.249*** *(2.821)*
Comparison of performance x Equity capital			0.035 *(0.376)*
Formal planning x Equity capital			0.150* *(1.328)*
Networking x Equity capital			-0.063 *(-0.651)*
R^2	0.121	0.188	0.222
R^2 (Adjusted)		0.164	0.199
F- value	15.218***	7.728***	9.516***
ΔR^2		0.028	.035
Max VIF	1.108	1.053	1.005

N= 104, t values are in parentheses
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

[16] Plot of Moderating Effects on Equity Capital is provided below in Figure F-1

FIGURE F-1: PLOT OF MODERATING EFFECTS OF EQUITY CAPITAL



Appendix G The Generational Effects of Organisational Learning on Innovation and Firm Performance

TABLE G-1 ORGANISATIONAL LEARNING AND INNOVATION IN FAMILY SMES

	1st Generation	2nd + Generation	All
Independent variables:			
Employee training	0.033 *(0.211)*	0.176 *(1.044)*	0.107 *(1.071)*
Management development	0.006 *(0.039)*	0.049 *(0.388)*	0.029 *(0.308)*
Comparison of performance	0.213 *(1.240)*	0.043 *(0.300)*	0.091 *(0.963)*
Formal planning	0.184 *(1.211)*	0.015 *(0.116)*	0.040 *(0.410)*
Networks	0.279** *(1.918)*	0.092 *(0.743)*	0.179** *(1.921)*
Control variables:			
Firm size (Ln - employees)	-0.307** *(-2.111)*	-0.302*** *(-2.457)*	-0.296*** *(-3.180)*
Firm age	249** *(1.725)*	-0.132 *(-1.053)*	0.011 *(0.120)*
Past performance	-0.361** *(-2.441)*	0.043 *(0.346)*	-0.124* *(-1.307)*
Intercept	9.490*** *(2.817)*	9.679*** *(3.583)*	9.286*** *(4.359)*
R square	0.178	0.091	0.129
F-value	4.227**	6.035**	7.508***
Max VIF	1.106	1.045	1.104

N= 104 (All), N = 42 (1st generation), N= 62 (2nd + generations), t values are in parentheses
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed)

TABLE G-2 ORGANISATIONAL LEARNING AND FIRM PERFORMANCE IN FAMILY SMES

Variables	Firm Performance - SG		
	1st Generation	2nd +Generation	All
Independent variable:			
Employee training	0.044 *(0.295)*	-0. 057 *(-0.469)*	0.024 *(0.233)*
Management development	0.286** *(2.026)*	0. .034 *(0. .280)*	0.172** *(1.8582)*
Comparison of performance	0.127 *(0.852)*	0.120 *(1.012)*	0.073 *(0.766)*
Formal planning	0.221* *(1.558)*	0.121 *(1.019)*	0.212** *(2.295)*
Networks	0.354** *(2.354)*	0.060 *(0.495)*	0.101 *(1.056)*
Control variables:			
Innovation	9..247** *(1.707)*	0. .390*** *(2.890)*	0.354*** *(3.923)*
Firm size (Ln - employees)	9.093 *(0.628)*	0. .122 *(0. .979)*	0.098 *(1.023)*
Firm age	9.010 *(0.070)*	-0.045 *(-0.366)*	-0.045 *(-0.491)*
Past performance	-0.062 *(-0.384)*	0. .089 *(0. .749)*	0.123* *(1.348)*
Intercept	0.923 *(0.237)*	0.405 *(0.222)*	0.273 *(0.129)*
R square	0.270	0.152	0.188
F-value	4.692***	10.749***	7.728***
Max VIF	1.012	1.115	1.136

N= 104 (All), N = 42 (1st generation), N= 62 (2nd +generations), t values are in parentheses
*** Significant at the 99% confidence interval (one-tailed)
** Significant at the 95% confidence interval (one-tailed)
* Significant at the 90% confidence interval (one-tailed